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Forest Vegetation on National Forests in the Rocky Mountain and Intermountain Regions: Habitat Types and Community Types

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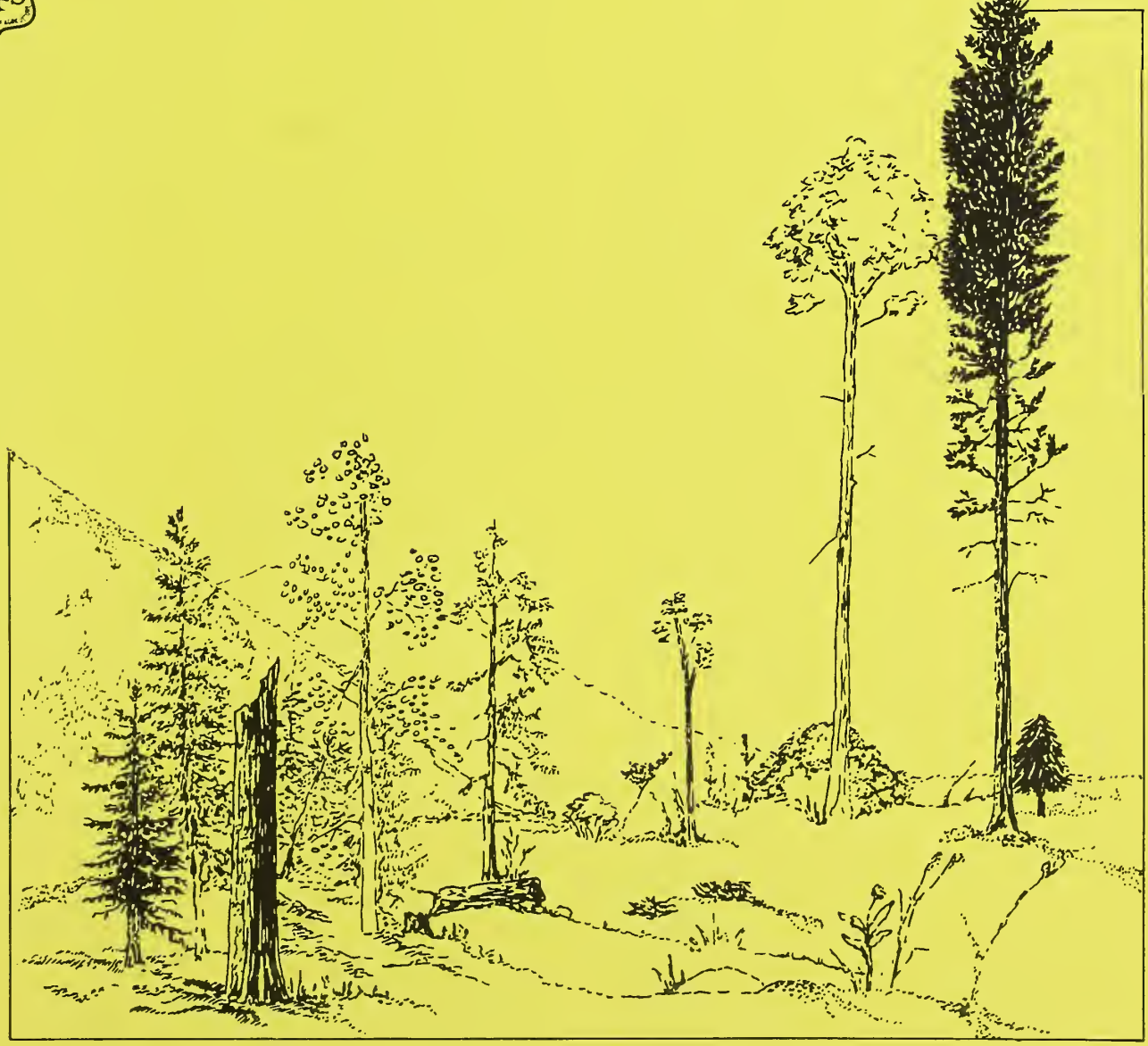

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Forest Vegetation on National Forests in the Rocky Mountain and Intermountain Regions: Habitat Types and Community Types

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Abstract

Habitat types and community types and their phases for the major forest tree species in the Rocky Mountain and Intermountain regions are tabulated. Included are the name(s), general location, elevation, relative site, successional status, principal tree and undergrowth associates, and the authority.

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Forest Vegetation on National Forests in the Rocky Mountain and Intermountain Regions: Habitat Types and Community Types

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In 1985, a list was published that documented habitat types, community types, and plant communities in the Rocky Mountain and Intermountain regions in which interior *Pinus ponderosa*, interior *Pseudotsuga menziesii*, interior *Abies concolor*, *Picea pungens*, *Populus tremuloides*, *Pinus contorta*, *Picea engelmannii*, and *Abies lasiocarpa* occurred as either a major climax, co-climax, minor climax, or major seral species (Alexander 1985). This paper is intended to supplement the 1985 publication by including newly available data and data on phases omitted in the 1985 publication. Moreover, the habitat and community types in the series in which the naming species occurs, listed in the 1985 publication, are repeated for the readers convenience. In addition to the species listed above, forested habitat types and community types and their phases are included that are dominated by *Pinus leiophylla*, *Pinus engelmannii*, *Pinus strobiformis*, *Abies grandis*, *Thuja plicata*, *Tsuga heterophylla*, *Picea glauca*, *Pinus flexilis*, *Pinus aristata*, *Tsuga mertensiana*, *Pinus albicaulis*, and *Larix lyalli*. Woodland and riparian habitat types and community types are not included, because these classifications are incomplete.

Table A1 lists the identified habitat types and community types and their phases for all forest tree species in the Rocky Mountain and Intermountain regions. Also included are the general location, elevation, site, successional status, principal tree and undergrowth associates, and the authority for the classification.

Some of the terms used in the table are clarified as follows.

1. Habitat type is the basic unit in classifying lands based on potential (climax) natural vegetation. A "habitat type" represents, collectively, all parts of the landscape that support, or have the potential of supporting, the same climax vegetation. The climax vegetation upon which the classification is based is called a "plant association." The first level of the classification is the "series," which is the grouping of all plant associations having the same overstory (climax) dominants. For example, all habitat types with *Pinus leiophylla* as the potential climax dominant are grouped into the *Pinus leiophylla* series.

2. Habitat types within a series are distinguished on the basis of undergrowth unions, the smallest "structural unit" of the vegetation. Each union comprises one or more undergrowth species that exhibit similar microenvironmental requirements.

3. The term "community type" has been used to identify vegetation that may be either (1) climax, but about which there is uncertainty; (2) seral, but the trend toward climax is not evident; or (3) the recognized plant community in place, which varies at any given time. Community types have one or more overstory dominants and characteristic undergrowth species. The undergrowth may be climax, but the overstory dominants often are long-lived, seral species that may be self-perpetuating because of repeated disturbance that prevents or slows down the succession to climax vegetation.

4. The description of the site (e.g., warm dry, cool dry) refers only to the series and location and, therefore, is relative. Obviously, a warm dry *Pinus ponderosa* site is not the same as a warm dry *Abies lasiocarpa* site.

5. In those habitat types where more than one phase is recognized, the typic phase is listed first, followed by the other phases. Phase is a subdivision of a habitat type representing a characteristic variation in climax vegetation and environmental conditions.

6. Synonyms of habitat types and closely related habitat types (which may be the same habitat type) are included within brackets.

7. Under the heading "Principal undergrowth species," the undergrowth species for which the habitat type is named is listed first, followed in order by shrubs, graminoids, and forbs.

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Table A1.—Forest habitat types and community types in the Rocky Mountains.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
			Pinus leiophylla series			
Pinus leiophylla/ Arctostaphylos pungens C.T.	Mountains of south-central Arizona (5,200-7,100)	Hot very dry	*P. leiophylla* probably climax	*Juniperus deppeana*	*A. pungens* *Quercus* spp.	Muldavin et al. 1988
Pinus leiophylla/ Quercus arizonica H.T.	Mountains of south-central Arizona (4,900-7,100)	Hot very dry	*P. leiophylla* climax or co-climax with *Pinus ponderosa* *Pinus discolor* *J. deppeana*	*P. ponderosa* *P. discolor* *J. deppeana*	*Q. arizonica* *Arctostaphylos* spp. *Quercus hypoleucoides* *Rhus aromatica* *Muhlenbergia longiligule*	DeVelice and Ludwig 1983 Muldavin et al. 1988
Pinus leiophylla/ Quercus emoryi H.T.	Mountains of south-central Arizona (4,900-6,500)	Hot very dry	*P. leiophylla* climax or co-climax with *P. discolor* *J. deppeana*	*P. discolor* *J. deppeana*	*Q. emoryi* *Q. arizonica* *Aristida orcuttiana* *Muhlenbergia* spp.	Muldavin et al. 1986
Pinus leiophylla/ Quercus hypoleucoides H.T.	Mountains of south-central Arizona (5,600-7,100)	Hot dry	*P. leiophylla* climax or co-climax with *P. discolor* *J. deppeana*	*P. discolor* *J. deppeana*	*Q. hypoleucoides* *Q. arizonica* *Muhlenbergia* spp.	DeVelice and Ludwig 1983 Muldavin et al. 1986
Pinus leiophylla/ Quercus toumeyi H.T.	Mountains of south-central Arizona (5,500-6,500)	Hot very dry	*P. leiophylla* climax or co-climax with *P. discolor.* *J. deppeana* minor climax	*P. discolor* *J. deppeana*	*Q. toumeyi* *A. pungens*	DeVelice and Ludwig 1983
Pinus leiophylla/ Piptochaetium fimbriatum H.T. (Semi-riparian forest)	Mountains of south-central Arizona (5,000-6,000)	Hot moist	*P. leiophylla* climax or co-climax with *P. discolor* *J. deppeana*	*Pinus engelmannii* *P. discolor* *Cupressus arizonica* *J. deppeana* *Juniparus erythrocarpa*	*P. fimbriatum* *Juglans major* *Prunus serotina* *Q. arizonica* *Q. hypoleucoides*	DeVelice and Ludwig 1983 Muldavin et al. 1986
			Pinus engelmonnii series			
Pinus engelmannii/ Quercus arizonica H.T.	Mountains of south-central Arizona (6,000-6,500)	Warm very dry	*P. engelmannii* climax or co-climax with *J. deppeana.* *P. discolor* minor climax	*P. leiophylla* *P. discolor* *J. deppeana*	*Q. arizonica* *M. longiligula*	DeVelice and Ludwig 1983
Pinus engelmennii/ Quercus emoryi H.T.	Mountains of southern Arizona (5,500-6,000)	Warm very dry	*P. engelmannii* climax	*P. leiophylla* *J. deppeane*	*Q. emoryi* *Muhlenbergia emersleyi* *M. longiligula*	Muldavin et al. 1986
Pinus engelmannii/ Quercus hypoleucoides H.T.	Mountains of south-central Arizona (5,800-7,100)	Warm dry	*P. engelmannii* climax, *P. discolor* *P. deppeana* minor climaxes	*P. leiophylla* *P. discolor* *J. deppeana*	*Q. hypoleucoides* *Q. arizonica* *M. longiligula*	DeVelice and Ludwig 1983 Muldavin et al. 1986
Pinus engelmannii/ Quercus rugosa H.T.	Mountains of south-central Arizona (7,200-8,000)	Warm dry to well-drained	*P. engelmannii* climax	*P. leiophylla* *J. deppeana*	*Q. rugosa* *M. longiligula*	Muldavin et al. 1986
Pinus engelmannii/ Muhlenbergia longiligula H.T.	Mountains of south-central Arizona (6,500-7,000)	Warm dry	*P. engelmannii* climax. *P. discolor* *J. deppeana* minor climaxes	*P. discolor* *J. deppeane*	*M. longiligula* *Q. gambelii* *Q. hypoleucoides*	DeVelice and Ludwig 1983
			Pinus ponderosa series			
Pinus ponderosa/ Arctostaphylos patula H.T.	Mountains of southern Utah and western Colorado (7,500-8,500)	Warm very dry	*P. ponderosa* climax	*Pinus flexilis* *Juniperus scopulorum*	*A. patula* *Berberis repens* *Quercus gambelii* *Purshia tridentata* *Carex rossii*	Hoffman 1988 Youngblood and Mauk 1985
Pinus ponderosa/ Arctostaphylos pungens C.T. [*P. ponderosa/ Arctostaphylos* spp. C.T.] [*P. ponderosa*/Mixed chapparel C.T.]	Mountains of Arizona (5,000-7,600)	Warm vary dry	*P. ponderosa* climax or co-climax with *J. deppeana*	*P. edulis* *J. deppeana*	*A. pungens* *Arctostaphylos* spp. *Cercocarpus montanus* *Quercus* spp. *Bouteloue gracilis* *Muhlenbergia virescens*	Fitzhugh et al. 1987 Hanks et al. 1983 Muldavin et al. 1986
Pinus ponderosa/ Arctostephylos uva-ursi H.T.	Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (5,100-6,700); mountains of southeastern Wyoming (8,300-8,300), southern Colorado, and northern New Mexico (7,700-9,200)	Warm vary dry	*P. ponderosa* climax. *P. menziesii* may be minor climax (CO,NM)	Usually pure stands (SD) *P. flexilis* *Populus tremuloides* (WY) *Pseudotsuga menziesii* (CO,NM)	*A. uva-ursi* *Symphoricarpos albus* *Festuca arizonica* *Muhlenbergia montana* *Carex* spp. *Arnica cordifolia* *Lathyrus ochroleucus* *Lupinus argenteus*	Alexander et al. 1986 DeVelice et al. 1986 Hoffman and Alexander 1987
Pinus ponderosa/ Artemisia nova H.T. [*P. ponderosa/ Artemisia arbuscula* H.T.]	Mountains of southern Utah (8,000-9,000), northern New Mexico, and southern Colorado (8,000-8,200)	Warm very dry	*P. ponderosa* climax (UT) or co-climax with *P. edulis* *J. scopulorum* (CO,NM)	*P. edulis* *P. flexilis* (UT) *J. scopulorum*	*A. nova* *A. arbuscula* *Chrysothamnus viscidiflorus* *Q. gambelii* *Tetradymia canescens* *B. gracilis*	DeVelice et al. 1986 Youngblood and Mauk 1985
Pinus ponderosa/ Cercocarpus ledifolius H.T.	Mountains of central and southern Utah (6,800-8,100)	Warm very dry	*P. ponderosa* climax. *J. scopulorum* minor climax	*P. edulis* *J. scopulorum*	*C. ledifolius* *A. tridentata* *Juniperus* spp. *Q. gambelii* *Symphoricarpos oreophilus*	Youngblood and Mauk 1985
Pinus ponderosa/ Cercocarpus montanus H.T. [*P. ponderosa/C. montanus-Rhus trilobeta* H.T.]	Front Range, north-central Colorado (6,300-7,000)	Warm vary dry	*P. ponderosa* climax	Usually pure stands. May contain *P. menziesii*	*C. montanus* *Opuntia polyecanthe* *R. trilobeta* *C. rossii* *Artemisia frigida* *Geranium fremontii*	Hess and Alexander 1986 Radloff 1983
Pinus ponderosa/ Cowania mexicana C.T.	Mountains of northern Arizona (8,700-7,500)	Warm vary dry	*P. ponderosa* climax	Usually pure stands. May contain *P. edulis* *J. scopulorum*	*C. mexicana* *B. gracilis* *M. montana* *Sitanion hystrix*	Hanks et al. 1983
Pinus ponderosa/ Juglans major H.T. (Semi-riparian forest)	Mountains of south-central Arizona (5,500-8,500)	Warm moist	*P. ponderosa* climax	Usually pure stands	*J. major* *Agropyron* spp. *Panicum bulbosum* *Poe pratensis*	Muldavin et al. 1986

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
Pinus ponderosa/ *Juniperus communis* H.T.	Bighorn Mountains, north-central Wyoming; Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming; mountains of southwestern North Dakota and south-eastern Montana (4,000-6,300)	Warm dry to well-drained	*P. ponderosa* climax	Usually pure stands. May contain *P. tremuloides* *Quercus macrocarpa* (tree and/or shrub)	*J. communis* *B. repens* *Spiraea betulifolia* *S. albus* *Hesperochloa kingii* *P. pratensis* *Astragalus miser* *Clematis tenuiloba*	Hansen and Hoffman 1988 Hoffman and Alexander 1987
Pinus ponderosa/ *Juniperus scopulorum* H.T. [*P. ponderosa*-*J. scopulorum*/ *Bouteloua curtipendula* H.T.]	Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (3,800-4,000)	Warm dry to well-drained	*P. ponderosa* climax to co-climax with *J. scopulorum*	*J. scopulorum*	*B. curtipendula* *Oryzopsis micrantha* *Anemone patens* *A. frigida* *Campanula rotundifolia*	Hoffman and Alexander 1987
Pinus ponderosa/ *Physocarpus malvaceus* H.T.	Mountains of northern and central Idaho and eastern Washington (<3,000)	Warm dry	*P. ponderosa* climax	Usually pure stands	*P. malvaceus* *Ceanothus sanguineus* *Holodiscus discolor* *Erythronium grandiflorum* *Gallium boreale*	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Steele et al. 1981
Pinus ponderosa/ *Physocarpus monogynus* H.T.	Bighorn Mountains, north-central Wyoming (6,100-6,600); Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (5,100-5,700)	Warm dry to well-drained	*P. ponderosa* climax	Usually pure stands. May contain *J. scopulorum*	*P. monogynus* *B. repens* *S. betulifolia* *S. albus* *Cystopteris fragilis* *G. boreale* *Solidago speciosa*	Hoffman and Alexander 1978, 1987
Pinus ponderosa/ *Prunus virginiana* H.T.(MT,ND); C.T.(SD) *P. virginiana* (typic) phase *Shepherdia canadensis* phase (MT)	Mountains of south-eastern Montana, southwestern North Dakota, and northern Black Hills, South Dakota (3,500-4,300)	Warm moist to well-drained	*P. ponderosa* climax	Usually pure stands	*P. virginiana* *Amelanchier alnifolia* *B. repens* *S. canadensis* *S. albus* *Arnica cordifolia* *C. fragilis*	Hansen and Hoffman 1988 Hoffman and Alexander 1987 Pfister et al. 1977
Pinus ponderosa/ *Purshia tridentata* H.T. *P. tridentata* (typic) phase *Agropyron spicatum* phase (ID,MT) *Festuca idahoensis* phase (ID,MT)	Mountains of Montana, northern and central Idaho, eastern Washington (3,000-6,000), and southern Utah (7,100-9,000); Front Range of north-central Colorado (7,600-8,700)	Warm dry	*P. ponderosa* climax. *J. scopulorum* minor climax	*P. menziesii* *J. scopulorum*	*P. tridentata* *A. tridentata* *P. virginiana* *A. spicatum* *Aristida longiseta* *F. idahoensis* *M. montana* *C. rossii* *Balsamorhiza sagittata*	Daubenmire and Daubenmire 1968 Hess and Alexander 1986 Pfister et al. 1977 Steele et al. 1981 Youngblood and Mauk 1985
Pinus ponderosa/ *Quercus arizonica* H.T. *Q. arizonica* (typic) phase *Bouteloua gracilis* phase	Mountains of south-central Arizona (5,500-7,800)	Hot dry	*P. ponderosa* climax or co-climax with *J. deppeana*, *P. discolor* minor climax	*P. discolor* *J. deppeana*	*Q. arizonica* *Ceanothus fendleri* *Quercus* spp. *B. gracilis* *M. longiligula*	DeVelice and Ludwig 1983 Muldavin et al. 1986
Pinus ponderosa/ *Quercus emoryi* H.T.	Mountains of south-central Arizona (5,300-6,900)	Warm dry	*P. ponderosa* climax	*J. deppeana*	*Q. emoryi* *Arctostaphylos* spp. *C. fendleri* *Garrya wrightii* *Q. arizonica*	Muldavin et al. 1986
Pinus ponderosa/ *Quercus gambelii* H.T. [*P. ponderosa*-*Pinus edulis*/ *Q. gambelii* H.T.] [*P. ponderosa*/*Q. gambelii*-*Carex geyeri* H.T.] [*P. ponderosa*/ *Poa fendleriana* C.T.] *Q. gambelii* (typic) phase *P. edulis* phase (AZ,CO,NM) *Symphoricarpos oreophilus* phase (CO,UT) *Bouteloua gracilis* phase (AZ,NM) *Festuca arizonica* phase (AZ,CO,NM) *Muhlenbergia longiligula* phase (AZ,NM) *Schizachyrium scoparium* phase (NM)	Mountains of southern Utah, Colorado, New Mexico, and south-central and eastern Arizona (6,500-9,200)	Warm dry	*P. ponderosa* climax or co-climax with *P. edulis*, *Pinus engelmannii* *J. deppeana* *Juniperus monosperma* *J. scopulorum* minor climaxes	*P. edulis* *P. menziesii* *P. discolor* *P. engelmannii* *J. deppeana* *J. monosperma* *Juniperus osteosperma* *J. scopulorum*	*Q. gambelii* *B. repens* *J. communis* *Rosa woodsii* *S. oreophilus* *B. gracilis* *F. arizonica* *Koeleria cristata* (*K. macrantha*) *Muhlenbergia* spp. *P. fendleriana* *S. scoparium* *C. geyeri* *Achillea lanulosa*	Alexander et al. 1984a, 1987 DeVelice et al. 1986 DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Hanks et al. 1983 Hess and Wasser 1982 Hoffman 1988 Muldavin et al. 1986 Youngblood and Mauk 1985
Pinus ponderosa/ *Quercus grisea* H.T. *Q. grisea* (typic) phase *Muhlenbergia longiligula* phase *Muhlenbergia montana* phase	Mountains of southwestern New Mexico and eastern Arizona (6,100-8,800)	Warm dry	*P. ponderosa* climax or co-climax with *P. edulis* *J. deppeana* *J. monosperma*, *P. menziesii* minor climax	*P. edulis* *P. menziesii* *J. deppeana* *J. monosperma*	*Q. grisea* *B. gracilis* *M. longiligula* *M. montana* *M. virescens* *P. fendleriana*	Fitzhugh et al. 1987
Pinus ponderosa/ *Quercus hypoleucoides* H.T.	Mountains of south-central Arizona (5,700-8,000)	Warm dry	*P. ponderosa* climax. *P. discolor* *Pinus engelmannii* *J. deppeana* minor climaxes	*P. engelmannii* *P. leiophylla* *P. discolor* *J. deppeana*	*Q. hypoleucoides* *C. fendleri* *G. wrightii* *Quercus* spp. *M. longiligula* *P. fendleriana*	DeVelice and Ludwig 1983 Muldavin et al. 1986
Pinus ponderosa/ *Quercus macrocarpa* H.T.	Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (4,100-5,300)	Warm dry to well-drained	*P. ponderosa* climax	Usually pure stands	*Q. macrocarpa* *A. alnifolia* *B. repens* *Ostrya virginiana* *Elymus virginicus*	Hoffman and Alexander 1987
Pinus ponderosa/ *Quercus rugosa* H.T.	Mountains of south-central Arizona (7,000-8,800)	Warm moist to well-drained	*P. ponderosa* climax	Usually pure stands. May contain *Pinus strobiformis* *P. menziesii*	*Q. rugosa* *Quercus* spp.	DeVelice and Ludwig 1983 Muldavin et al. 1986
Pinus ponderosa/ *Quercus undulata* H.T. *Q. undulata* (typic) phase *Muhlenbergia dubia* phase (NM) *Muhlenbergia longiligula* phase (NM)	Mountains of northern and southern New Mexico (6,500-8,000)	Hot dry	*P. ponderosa* climax or co-climax with *P. edulis*, *J. deppeana* *J. monosperma* *J. scopulorum* minor climaxes	*P. menziesii* *P. strobiformis* *P. edulis* *J. deppeana* *J. monosperma* *J. scopulorum*	*Q. undulata* *Q. arizonica* *Q. gambelii* *Andropogon* spp. *Bouteloua* spp. *M. dubia* *M. longiligula* *Artemisia ludoviciana*	Alexander et al. 1984a DeVelice et al. 1986
Pinus ponderosa/ *Ribes inerme* H.T. (Scree forest)	Mountains of northern New Mexico (7,500-8,500)	Cool dry	*P. ponderosa* climax	*P. menziesii* *P. edulis* *J. scopulorum* *J. deppeana*	*R. inerme* *Q. gambelii* *M. montana* *P. fendleriana*	DeVelice et al. 1986

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
Pinus ponderosa/ *Spiraea betulifolia* H.T.	Bighorn Mountains, north-central Wyoming (5,600-5,900)	Warm dry	*P. ponderosa* climax	Usually pure stands	*S. betulifolia* *C. tenuiloba* *S. albus* *F. idahoensis* *H. kingii* *G. boreale*	Hoffman and Alexander 1976
Pinus ponderosa/ *Symphoricarpos albus* H.T. *S. albus* (typic) phase *Berberis repens* phase (MT) *Oryzopsis asperifolia* phase (SD) *Balsamorhiza sagittata* phase (SD)	Mountains of eastern Washington, northern and central Idaho, and central and southeastern Montana (2,600-5,400); Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (4,200-6,000)	Warm dry	*P. ponderosa* climax	Usually pure stands. May contain *P. tremuloides* (SD,WY)	*S. albus* *B. repens* *J. communis* *P. virginiana* *Rosa* spp. *S. canadensis* *S. betulifolia* *O. asperifolia* *Carex foenea* *B. sagittata*	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Hoffman and Alexander 1987 Pfister et al. 1977 Steele et al. 1981
Pinus ponderosa/ *Symphoricarpos oreophilus* H.T.	Mountains of central Idaho (≤5,000) and southern Utah (7,900-8,800)	Warm dry	*P. ponderosa* climax	Usually pure stands (ID). May contain (UT) *J. scopulorum* *P. tremuloides*	*S. oreophilus* *A. alnifolia* *B. repens* *P. virginiana* *P. tridentata* *A. spicatum*	Steele et al. 1981 Youngblood and Mauk 1985
Pinus ponderosa/ *Agropyron spicatum* H.T.	Mountains of eastern Washington, Idaho, southeastern and west-central Montana, north-central Wyoming, and southwestern North Dakota (2,400-6,000)	Hot very dry	*P. ponderosa* climax. *J. scopulorum* may be minor climax	Usually pure stands. May contain *J. scopulorum*	*A. spicatum* *Artemisia* spp. *A. longiseta* *Bromus tectorum* *F. idahoensis* *Poa* spp. *B. sagittata* *Lometium dissectum* *Melica bulbosa*	Cooper et al. 1987 Daubenmire and Daubenmire 1988 Hansen and Hoffman 1988 Hoffman and Alexander 1976 Pfister et al. 1977 Steele et al. 1981
Pinus ponderosa/ *Andropogon* spp. H.T.	Mountains of southeastern Montana (≤4,000)	Warm very dry	*P. ponderosa* climax. *J. scopulorum* minor climax	*J. scopulorum*	*A. gerardii* *A. scoparius*	Pfister et al. 1977
Pinus ponderosa/ *Bouteloua gracilis* H.T. *B. gracilis* (typic) phase *Pinus edulis* phase (AZ) *Artemisia tridenteta* phase (AZ) *Quercus gambelii* phase (AZ) *Andropogon hallii* phase (AZ) *Schizachyrium scoparium* phase (NM) *Vitis arizonica* phase (AZ)	Mountains of Arizona and New Mexico (5,700-8,600)	Warm very dry	*P. ponderosa* climax or co-climax with *P. edulis* *P. discolor* *J. deppeana.* *J. monosperme* J. scopulorum minor climaxes	*P. edulis* *P. discolor* *J. deppeana* *J. monosperma* *J. scopulorum*	*B. gracilis* *A. tridenteta* *Q. gambelii* *Q. grisea* *A. hallii* *M. longiligula* *P. fendleriana* *S. scoparium* *V. erizonica*	Alexander et al. 1987 DeVelice et al. 1986 DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Hanks et al. 1983 Muldavin et al. 1986
Pinus ponderosa/ *Festuca arizonica* H.T. *F. arizonica* (typic) phase *Quercus gambelii* phase (AZ,NM) *Bouteloua gracilis* phase *Danthonia parryi* phase (CO,NM)	Mountains of Arizona and New Mexico (7,200-9,500), Front Range and mountains of southern Colorado (9,500-9,900)	Warm dry	*P. ponderosa* climax. *P. edulis* *J. deppeana* *J. monosperma* *J. scopulorum* minor climaxes in some phases (AZ,NM)	*P. edulis* *P. strobiformis* *P. menziesii* (CO) *P. aristata* (CO) *J. deppeana* *J. monosperma* *J. scopulorum*	*F. arizonica* *C. fendleri* *Q. gambelii* *Ribes cereum* *B. gracilis* *D. parryi* *M. montana* *P. fendleriana* *Haplopappus parryi*	Alexander et al. 1987 DeVelice et al. 1986 Fitzhugh et al. 1987 Hanks et al. 1983 Komarkova et al. 1988 Radloff 1983
Pinus ponderosa/ *Festuca idahoensis* H.T. *F. idahoensis* (typic) phase *P. ponderosa* phase (ID) *Arctostaphylos patula* phase (UT) *Artemisia tridenteta* phase (UT) *Festuca scabrella* phase (MT)	Mountains of eastern Washington, Idaho, central and southeastern Montana, northern Utah, north-central Wyoming (2,500-6,000), and south-central Colorado (8,800-9,300)	Warm dry	*P. ponderosa* climax	Usually pure stands. May contain (UT) *Pinus contora* *J. scopulorum* *P. tremuloides*	*F. idahoensis* *A. patula* *A. tridenteta* *B. repens* *P. tridentate* *S. elbus* *A. spicatum* *Calamagrostis rubescens* *F. scaberila* *Achillee millefolium* *B. sagittata*	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Hansen and Hoffman 1988 Hoffman and Alexander 1976 Komarkova et al. 1988 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981
Pinus ponderosa/ *Hesperochloa kingii* H.T.	Mountains of north-central Colorado (7,300-8,400)	Warm dry	*P. ponderosa* climax	*P. menziesii* *P. flexilis*	*H. kingii* *R. cereum* *K. cristata* (*K. mecrantha*) *Allium geyeri* *A. frigida* *G. fremontii* *Sedum stenopetalum*	Hess and Alexander 1986
Pinus ponderosa/ *Muhlenbergia montana* H.T. [*P. ponderosa*-*Pseudotsuga menziesii*/ *M. montana* H.T.] [*P. ponderosa*/ *Poa longiligula* C.T.]	Mountains of Arizona and New Mexico, central and southern Utah, and central and southern Colorado (6,800-8,800)	Warm dry	*P. ponderosa* climax. *P. edulis* *J. deppeene* minor climaxes	*P. menziesii* *P. edulis* *P. flexilis* *J. deppeana* *J. monosperma* *J. scopulorum*	*M. montana* *B. repens* *C. montanus* *Q. gambelii* *B. gracilis* *P. fendleriana* *P. longiligula* *S. hystrix* *Senecio neomexicanus* *Smilacine stellata* *Solidago canadensis* *Yucca glauca*	Alexander et al. 1987 DeVelice et al. 1986 Fitzhugh et al. 1987 Hanks et al. 1983 Hess and Alexander 1986 Muldavin et al. 1986 Radloff 1983 Youngblood and Mauk 1985
Pinus ponderosa/ *Muhlenbergia virescens* H.T. [*P. ponderosa*/*M. virescens*-*Festuca arizonica* H.T.] [*P. ponderosa*/*M. virescens*-*F. arizonica*/ *Bouteloua gracilis* C.T.] *M. virescens* (typic) phase *Quercus gambelii* phase *B. gracilis* phase (AZ) *F. arizonica* phase	Mountains of Arizona and southwestern New Mexico (8,800-9,300)	Warm dry	*P. ponderosa* climax. *P. edulis* *P. manziesii* *P. strobiformis* *Pinus engelmannii* *J. deppeana* minor climaxes	*P. edulis* *P. menziesii* *P. strobiformis* *P. engelmannii* *J. deppeana*	*M. virescens* *B. repens* *C. fendleri* *Quercus* spp. *B. gracilis* *F. arizonica* *M. montana* *P. fendleriana* *P. longiligula* *Carex* spp. *Senecio wootonii*	Alexander et al. 1987 DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Hanks et al. 1983 Muldavin et al. 1986
Pinus ponderosa/ *Oryzopsis hymenoides* H.T. (Sand hills)	Mountains of northern New Mexico and southern Colorado (5,500-8,000)	Warm very dry	*P. ponderosa* climax. *J. monosperma* minor climax	*J. monosperma*	*Q. hymenoides* *C. montanus* *S. scoparium* *S. hystrix* *Heterotheca fulcreta*	DeVelice et al. 1986

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
Pinus ponderosa/ Poa pratensis H.T. [*Pinus ponderosa/* Riparian forest H.T.]	Mountains of southwestern and northern New Mexico and southern Colorado (6,000-8,500)	Warm moist	*P. ponderosa* climax	*Populus angustifolia* *Acer negundo*	*P. pratensis* *Ainus tenuifolia* *Q. gambelii* *Galium* spp. *Iris missouriensis* *Juncus* spp.	Alexander et al. 1987 DeVelice et al. 1988
Pinus ponderosa/ Stipa comata H.T.	Mountains of northern Idaho and eastern Washington (2,500-3,000)	Warm very dry	*P. ponderosa* climax	Usually pure stands	*S. comata* *A. longiseta* *Poa secunda* *Stipa* spp.	Daubenmire and Daubenmire 1968
Pinus ponderosa/ Stipa occidentalis H.T.	Mountains of central Idaho (3,500-4,800)	Warm very dry	*P. ponderosa* climax	Usually pure stands	*S. occidentalis* *P. tridentata* *Stipa thurberiana*	Steele et al. 1981
Pinus ponderosa/ Carex geyeri H.T.	Mountains of northern Utah (7,200-8,300), and southeastern Wyoming (6,100-8,500)	Cool dry	*P. ponderosa* climax	*P. contorta* (UT) *P. tremuloides*	*C. geyeri* *B. repens* *Pachistima myrsinites* *Poa nervosa* *A. cordifolia*	Alexander et al. 1986 Mauk and Henderson 1984
Pinus ponderosa/ Carex hellophylla H.T.	Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (4,500-5,200); mountains of southwestern North Dakota and southeastern Montana (3,900-4,000)	Warm very dry	*P. ponderosa* climax	Usually pure stands. May contain *J. scopulorum*	*C. hellophylla* *A. spicatum* *Danthonia spicata* *F. idahoensis* *P. pratensis* *Stipa* spp. *Aster ciliolatus* *Haterotheca villosa*	Hansen and Hoffman 1988 Hoffman and Alexander 1987
Pinus ponderosa/ Carex rossii H.T.	Front Range, north-central Colorado, and mountains of southeastern Wyoming (5,800-6,400)	Warm dry to well-drained	*P. ponderosa* climax	Usually pure stands. May contain *P. menziesii* (CO) *J. scopulorum*	*C. rossii* *J. communis* *K. cristata* (*K. macrantha*) *M. montana* *A. lanulosa*	Alexander et al. 1988 Hess and Alexander 1986
Pinus ponderosa/ Cinder Soils H.T.	Mountains of north-central and northwestern New Mexico (7,700-8,500)	Warm dry	*P. ponderosa* climax. *P. edulis* minor climax	*P. edulis*	*Q. gambelii* *R. cereum* *B. gracilis* *M. montana* *Lupinus* spp.	Alexander et al. 1987
Pinus ponderosa/ Rockland H.T.	Mountains of eastern Arizona, and northern and southwestern New Mexico (8,300-8,700)	Warm dry	*P. ponderosa* climax. *P. menziesii* *P. edulis* *J. deppeana* minor climaxes	*P. menziesii* *P. edulis* *P. strobiformis* *J. deppeana*	*Q. grisea* *Bouteloua* spp. *F. arizonica* *M. montana* *M. virescens* *Solidago* spp.	Alexander et al. 1987 Fitzhugh et al. 1987
***Pinus strobiformis* series**						
Pinus strobiformis/ Festuca arizonica H.T.	Mountains of northern Arizona (7,500-9,000)	Warm dry	*P. strobiformis* co-climax with *P. menziesii*	*P. menziesii* *P. ponderosa*	*F. arizonica* *B. repens* *Bromus ciliatus* *M. montana*	Moir and Ludwig 1979
***Pseudotsuga menziesii* series**						
Pseudotsuga menziesii/ Acer glabrum H.T. *A. glabrum* (typic) phase *Pachistima myrsinites* phase (ID,WY) *Symphoricarpos oreophilus* phase (ID)	Mountains of central and southeastern Idaho, northwestern Wyoming (4,800-8,300), and northern Utah (5,800-7,700)	Cool moist	*P. menziesii* climax	*Abies grandis* *P. ponderosa* *P. contorta* *P. flexilis* *J. scopulorum* *P. tremuloides*	*A. glabrum* *A. alnifolia* *P. myrsinites* *P. virginiana* *R. cereum* *S. oreophilus* *C. rubescens* *A. cordifolia*	Mauk and Henderson 1984 Steele et al. 1981, 1983
Pseudotsuga menziesii/ Acer grandidentatum H.T.	Mountains of south-central Arizona (6,500-7,000)	Warm moist	*P. menziesii* climax	*P. ponderosa* *J. deppeana*	*A. grandidentatum* *Holodiscus dumosus* *Q. arizonica* *Q. hypoleucoides*	DeVelice and Ludwig 1983
Pseudotsuga menziesii/ Arctostaphylos patula H.T.	Mountains of central and southern Utah (7,200-8,700)	Warm dry	*P. menziesii* climax. *J. scopulorum* minor climax	*P. ponderosa* *P. flexilis* *J. scopulorum*	*A. patula* *B. repens* *Ceanothus martinii* *S. oreophilus*	Youngblood and Mauk 1985
Pseudotsuga menziesii/ Arctostaphylos uva-ursi H.T.	Mountains of central Montana (4,700-6,500), and southwestern New Mexico (9,500-10,000)	Warm very dry	*P. menziesii* climax or co-climax with *P. strobiformis*	*P. strobiformis* (NM) *P. ponderosa* *P. flexilis* (MT) *P. tremuloides* (NM)	*A. uva-ursi* *A. spicatum* *B. ciliatus* *Festuca* spp. *M. montana* *B. sagittata* *Lithospermum ruderale* *Solidago spathulata*	Fitzhugh et al. 1987 Pfister et al. 1977
Pseudotsuga menziesii/ Berberis repens H.T. *B. repens* (typic) phase *Pinus ponderosa* phase (UT) *Juniperus communis* phase (ID,UT,WY) *Symphoricarpos oreophilus* phase (ID,UT,WY) *Carex geyeri* phase (ID,UT)	Mountains of central and southeastern Idaho (4,500-7,700), northwestern Wyoming (5,700-8,500), and northern Utah (5,400-9,700); mountains of north-central Wyoming (7,000-8,500), and western Colorado (8,000-9,900)	Warm dry to well-drained	*P. menziesii* climax. *P. ponderosa* *P. contorta* *P. flexilis* minor climaxes	*P. ponderosa* *P. contorta* *P. flexilis* *A. grandis* (Not WY) *J. scopulorum* *P. tremuloides*	*B. repens* *J. communis* *P. myrsinites* *S. oreophilus* *C. geyeri* *C. rossii* *A. cordifolia* *Galium septentrionale* *Smilacina racemosa*	Hoffman 1988 Hoffman and Alexander 1976 Mauk and Henderson 1984 Steele et al. 1981, 1983 Youngblood and Mauk 1985
Pseudotsuga menziesii/ Carcocarpus ledifolius H.T.	Mountains of southeastern and central Idaho, and Utah (6,000-8,100)	Warm dry	*P. menziesii* climax or co-climax with *P. ponderosa*. *P. flexilis* *J. scopulorum* minor climaxes	*P. ponderosa* *P. flexilis* *J. scopulorum* *P. tremuloides*	*C. ledifolius* *B. repens* *S. oreophilus* *A. spicatum* *A. cordifolia* *B. sagittata* *Crepis aluminata*	Mauk and Henderson 1984 Steele et al. 1981, 1983 Youngblood and Mauk 1985
Pseudotsuga menziesii/ Carcocarpus montanus H.T.	Mountains of central and southern Utah (7,200-8,200)	Warm dry	*P. menziesii* climax. *P. edulis* *J. osteosperma* *J. scopulorum* minor climaxes	*P. edulis* *J. osteosperma* *J. scopulorum*	*C. montanus* *B. repens* *J. communis* *Shepherdia rotundifolia* *S. oreophilus*	Youngblood and Mauk 1985
Pseudotsuga menziesii/ Clematis pseudoalpina H.T.	Front Range, central Colorado (7,800-9,300)	Warm well-drained	*P. menziesii* climax	*P. ponderosa* *P. flexilis* *P. tremuloides*	*C. pseudoalpina* *J. communis* *Rosa* spp. *Calamagrostis purpurascens* *Carex* spp. *Fragaria* spp. *Saxifraga bronchialis* *Thalictrum fendleri* *Valeriana edulis*	Radloff 1983

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
Pseudotsuga menziesii *Holodiscus dumosus* H.T. (Scree forest)	Mountains of northern and southwestern New Mexico, and southern Colorado (9,600-9,900)	Warm dry	*P. menziesii* climax or co-climax with *P. strobiformis*	*P. strobiformis* *Abies lasiocarpa* *Picea engelmannii* *P. flexilis* *P. tremuloides*	*H. dumosus* *C. montanus* *Jamesia americana* *Ribes* spp. *Salix scouleriana* *S. oreophilus*	DeVelice et al. 1988 Fitzhugh et al. 1987
Pseudotsuga menziesii *Jamesia americana* H.T.	Front Range, north-central Colorado, and mountains of south-central Colorado (7,200-9,800)	Cool dry to well-drained	*P. menziesii* climax	*P. ponderosa* *P. contorta* *P. flexilis* *J. scopulorum*	*J. americana* *A. glabrum* *J. communis* *P. monogynus* *Fragaria ovalis* (*F. virginiana*) *Potentilla fissa*	Hess and Alexander 1986 Komarkova et al. 1988 Radloff 1983
Pseudotsuga menziesii *Juniperus communis* H.T.	Mountains of central and southwestern Montana (6,400-7,800), central Idaho, and northwestern Wyoming (7,400-10,300)	Cool dry to excessively drained	*P. menziesii* climax	*P. contorta* *P. flexilis* *J. scopulorum*	*J. communis* *Juniperus horizontalis* *S. canadensis* *S. oreophilus* *A. cordifolia* *A. miser* *F. ovalis* (*F. virginiana*)	Pfister et al. 1977 Steele et al. 1981, 1983
Pseudotsuga menziesii *Linnaea borealis* H.T. *L. borealis* (typic) phase *Symphoricarpos albus* phase (MT) *Vaccinium globulare* phase (MT) *Calamagrostis rubescens* phase (MT)	Mountains of central and northwestern Montana, and central Idaho (2,600-6,500)	Warm moist to well-drained	*P. menziesii* climax	*P. ponderosa* *P. contorta* *Larix occidentalis*	*L. borealis* *S. albus* *S. betulifolia* *V. globulare* *C. rubescens* *A. cordifolia*	Pfister et al. 1977 Steele et al. 1981
Pseudotsuga menziesii *Pachistima myrsinites* H.T. [*P. menziesii*/*P. myrsinites*-*Carex geyeri* H.T.]	Mountains of central and western Colorado (7,100-10,000)	Cool dry to well-drained	*P. menziesii* climax	*Picea engelmannii* *P. contorta* *P. tremuloides*	*P. myrsinites* *B. repens* *Q. gambelii* *S. oreophilus* *Vaccinium myrtillus* *C. geyeri* *A. cordifolia*	Hess and Wasser 1982 Hoffman and Alexander 1980, 1983 Komarkova et al. 1988
Pseudotsuga menziesii *Physocarpus malvaceus* H.T. *P. malvaceus* (typic) phase *Pseudotsuga menziesii* phase *Pinus ponderosa* phase (ID) *Pachistima myrsinites* phase (ID,WY) *Calamagrostis rubescens* phase (ID,MT) *Smilacina stellata* phase (ID)	Mountains of eastern Washington, Idaho, Montana (2,000-7,100), northwestern Wyoming (5,400-7,500), and Utah (5,000-9,100)	Cool moist to well-drained	*P. menziesii* climax	*P. ponderosa* *P. contorta* *P. flexilis* *L. occidentalis* *J. scopulorum* *P. tremuloides*	*P. malvaceus* *A. alnifolia* *B. repens* *H. discolor* *P. myrsinites* *S. albus* *C. rubescens* *C. geyeri* *A. cordifolia* *S. stellata*	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981, 1983 Youngblood and Mauk 1985
Pseudotsuga menziesii *Physocarpus monogynus* H.T.	Mountains of northwestern and north-central Wyoming (6,100-8,600); Front Range, north-central Colorado (5,900-7,700)	Warm well-drained	*P. menziesii* climax	*P. ponderosa* *P. contorta* *P. flexilis* *J. scopulorum*	*P. monogynus* *B. repens* *J. americana* *S. betulifolia* *S. oreophilus* *H. kingii* *P. pratensis* *G. fremontii*	Hess and Alexander 1986 Hoffman and Alexander 1976 Steele et al. 1983
Pseudotsuga menziesii *Purshia tridentata* H.T. [*P. menziesii*/*Arctostaphylos uva-ursi* H.T.] *Pinus ponderosa*/*Artemisia tridentata* H.T.]	Mountains of south-central Colorado (8,800-9,800)	Warm dry	*P. menziesii* climax	*P. ponderosa* *P. contorta* *P. tremuloides*	*P. tridentata* *A. tridentata* *A. uva-ursi* *J. communis* *K. cristata* (*K. mecrantha*) *C. foenea*	Komarkova et al. 1988
Pseudotsuga menziesii *Quercus arizonica* H.T.	Mountains of south-central Arizona (5,800-7,000)	Warm very dry	*P. menziesii* climax or co-climax with *P. ponderosa*	*P. ponderosa* *P. discolor* *J. deppeana*	*Q. arizonica* *Q. gambelii* *Q. hypoleucoides* *M. longiligula*	DeVelice and Ludwig 1983 Muldavin et al. 1986
Pseudotsuga menziesii *Quercus gambelii* H.T. *Q. gambelii* (typic) phase *Holodiscus dumosus* phase (NM) *Festuca arizonica* phase (NM) *Muhlenbergia virescens* phase (AZ,NM)	Mountains of New Mexico, Arizona, southern Utah, and southern Colorado (6,500-9,600)	Warm dry	*P. menziesii* climax or co-climax with *P. ponderosa* *P. strobiformis* *J. scopulorum* minor climaxes	*P. ponderosa* *P. strobiformis* *P. edulis* *Pinus engelmannii* *J. deppeana* *J. scopulorum*	*Q. gambelii* *H. dumosus* *P. myrsinites* *S. oreophilus* *F. arizonica* *M. montana* *M. virescens* *P. fendleriana* *C. rossii*	Alexander et al. 1984a, 1984b, 1987 DeVelice et al. 1986 DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Muldavin et al. 1986 Youngblood and Mauk 1985
Pseudotsuga menziesii *Quercus hypoleucoides* H.T.	Mountains of south-central and eastern Arizona, and southwestern New Mexico (6,800-8,800)	Warm dry to well-drained	*P. menziesii* climax or co-climax with *P. ponderosa*	*P. ponderosa* *P. strobiformis* *Pinus engelmannii* *P. discolor* *P. edulis* *Abies concolor*	*Q. hypoleucoides* *Agave* spp. *Q. arizonica* *Q. gambelii* *Q. rugosa* *Opuntia* spp. *M. longiligula* *P. fendleriana*	DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Moir and Ludwig 1979 Muldavin et al. 1986
Pseudotsuga menziesii *Quercus rugosa* H.T.	Mountains of south-central Arizona (8,500-8,700)	Warm to well-drained	*P. menziesii* climax	*P. ponderosa* *P. strobiformis*	*Q. rugosa* *Q. hypoleucoides*	DeVelice and Ludwig 1983 Muldavin et al. 1986
Pseudotsuga menziesii *Spiraea betulifolia* H.T. *S. betulifolia* (typic) phase *Pinus ponderosa* phase (ID) *Calamagrostis rubescens* phase (ID,WY)	Mountains of central Montana, Idaho (3,300-8,100), and northwestern Wyoming (6,000-8,200)	Warm dry	*P. menziesii* climax	*P. ponderosa* *P. contorta* *P. flexilis*	*S. betulifolia* *A. alnifolia* *B. repens* *C. rubescens* *A. cordifolia* *F. ovalis* (*F. virginiana*)	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981, 1983
Pseudotsuga menziesii *Symphoricarpos albus* H.T. *S. albus* (typic) phase *Pinus ponderosa* phase (ID) *Agropyron spicatum* phase (MT) *Calamagrostis rubescens* phase (ID,MT)	Mountains of eastern Washington, Idaho, Montana (2,700-7,200), and northwestern Wyoming (5,700-7,400)	Warm dry	*P. menziesii* climax	*P. ponderosa* *P. contorta* *L. occidentalis* *P. tremuloides*	*S. albus* *P. virginiana* *Rosa* spp. *S. betulifolia* *A. spicatum* *C. rubescens* *Festuca* spp. *C. geyeri*	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Pfister et al. 1977 Steele et al. 1981, 1983
Pseudotsuga menziesii *Symphoricarpos oreophilus* H.T.	Mountains of central Idaho, southwestern Montana, northwestern Wyoming (4,500-8,300), northern and southern Utah, and central and southern Colorado (7,000-9,800)	Warm dry	*P. menziesii* climax. *P. ponderosa* *P. flexilis* *J. scopulorum* minor climaxes	*P. ponderosa* *P. contorta* *P. flexilis* *J. scopulorum* *P. tremuloides*	*S. oreophilus* *A. tridentata* *B. repens* *P. virginiana* *Ribes* spp. *H. kingii* *C. geyeri* *Stellaria jamesiana* *T. fendleri*	Hess and Wasser 1982 Komarkova et al. 1988 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981, 1983 Youngblood and and Mauk 1985

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
Pseudotsuga menziesii *Vaccinium caespitosum* H.T.	Mountains of northern and central Idaho, and west-central and northwestern Montana (2,500-6,400)	Warm moist	*P. menziesii* climax	*P. ponderosa* *P. contorta* *L. occidentalis*	*V. caespitosum* *A. uva-ursi* *L. borealis* *S. albus* *C. rubescens* *C. geyeri*	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981
Pseudotsuga menziesii *Vaccinium globulare* H.T. *V. globulare* (typic) phase *Arctostaphylos uva-ursi* phase (MT) *Xerophyllum tenax* phase (MT)	Mountains of north-central Montana, and Idaho (4,300-7,400)	Cool dry	*P. menziesii* climax	*P. ponderosa* *P. contorta* *L. occidentalis*	*V. globulare* *A. uva-ursi* *C. geyeri* *A. corditolia* *Osmorhiza chilensis* *X. tenax*	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981, 1983
Pseudotsuga menziesii *Agropyron spicatum* H.T.	Mountains of central Montana, and northern and central Ideho (3,800-7,500)	Warm very dry	*P. menziesii* co-climax with *P. ponderosa.* *P. flexilis* *J. scopulorum* minor climaxes	*P. ponderosa* *P. flexilis* *J. scopulorum*	*A. spicatum* *A. tridentata* *F. idahoensis* *B. sagittata* *M. bulbosa*	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981
Pseudotsuga menziesii *Bromus ciliatus* H.T.	Mountains of southwestern New Mexico (9,000-10,000)	Cool moist to wet	*P. menziesii* climax. *P. ponderosa* *P. strobiformis* minor climaxes	*P. ponderosa* *P. strobiformis* *P. tremuloides*	*B. ciliatus* *A. glabrum* *P. fendleriana* *Erigeron eximius* *(E. superbus)*	Alexander et al. 1987 Fitzhugh et al. 1987
Pseudotsuga menziesii *Calamagrostis rubescens* H.T. *C. rubescens* (typic) phase *Pinus ponderosa* phase (ID,MT) *Arctostaphylos uva-ursi* phase (ID,MT) *Pachistima myrsinites* phase (ID,WY) *Agropyron spicatum* phase (MT) *Festuca idahoensis* phase (ID)	Mountains of eastern Washington, Idaho, Montana, northern Utah (4,100-7,900), and northwestern Wyoming (6,000-8,100)	Cool dry to well-drained	*P. menziesii* climax	*P. ponderosa* *P. contorta* *P. flexilis* *L. occidentalis* *P. tremuloides*	*C. rubescens* *A. uva-ursi* *B. repens* *P. myrsinites* *A. spicatum* *F. idahoensis* *C. geyeri* *A. corditolia* *Smilacina amplexicaulis*	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981, 1983
Pseudotsuga menziesii *Festuca arizonica* H.T.	Mountains of northern and southwestern New Mexico, eastern Arizona, and southern Colorado (8,200-10,000)	Warm dry	*P. menziesii* climax	*P. ponderosa* *P. strobiformis* *P. flexilis* *Pinus aristata* *P. edulis* *J. deppeana* *J. scopulorum* *P. tramuloides*	*F. arizonica* *A. uva-ursi* *H. dumosus* *O. gambelii* *B. ciliatus* *K. cristata* *(K. macrantha)* *M. montana* *P. fendleriana*	Alexander et al. 1984b, 1987 DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979
Pseudotsuga menziesii *Festuca idahoensis* H.T. *F. idahoensis* (typic) phase *Pinus ponderosa* phase (ID)	Mountains of southwestern Montana, northern and central Idaho (3,000-8,000), and south-central Colorado (6,000-10,000)	Warm dry	*P. menziesii* climax or co-climax with *P. ponderosa*	*P. ponderosa*	*F. idahoensis* *A. ainifolia* *P. virginiana* *Rosa* spp. *A. spicatum* *C. rubescens* *Eriogonum* spp.	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981 Komarkova et al. 1988
Pseudotsuga menziesii *Festuca scabrella* H.T.	Mountains of central and northwestern Montana (2,700-7,400)	Warm dry	*P. menziesii* co-climax with *P. ponderosa.* *P. flexilis* minor climax	*P. ponderosa* *P. flexilis*	*F. scabrella* *F. idahoensis* *A. spicatum* *K. cristata* *(K. macrantha)* *B. sagittata*	Pfister et al. 1977
Pseudotsuga menziesii *Muhlenbergia montana* H.T.	Mountains of southwestern New Mexico and eastern Arizona (7,500-9,800)	Warm dry	*P. menziesii* climax or co-climax with *P. ponderosa*	*P. ponderosa* *P. strobiformis* *P. edulis* *J. deppeana* *J. monosperma* *J. scopulorum*	*M. montana* *B. repens* *O. gambelii* *P. fendleriana* *Geranium caespitosum* *Lithospermum multiflorum*	Alexander et al. 1987 Fitzhugh et al. 1987
Pseudotsuga menziesii *Muhlenbergia virescens* H.T. [*P. menziesii-* *Pinus strobiformis/* *M. virascens* H.T.]	Mountains of southwestern New Mexico and Arizona (7,800-9,400)	Warm dry	*P. menziesii* climax or co-climax with *P. ponderosa* *P. strobiformis.* *A. concolor* minor climax	*P. ponderosa* *P. strobiformis* *A. concolor* *J. deppeana* *P. tremuloides*	*M. virescens* *C. fendleri* *O. gambelii* *B. ciliatus* *P. fendleriana* *C. rossii* *Geranium richardsonii* *F. ovalis* *(F. virginiana)*	Alexander et al. 1984b DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Moir and Ludwig 1979 Muldavin et al. 1986
Pseudotsuga menziesii *Carex geyeri* H.T. *C. geyeri* (typic) phase *Pinus ponderosa* phase (ID) *Symphoricarpos oreophilus* phase (ID)	Mountains of Montana east of Continental Divide (6,100-7,600) and northern and central Idaho (3,700-8,700); Front Range and mountains of south-central Colorado (7,800-8,800)	Cool dry	*P. menziesii* climax	*P. ponderosa* *P. contorta* *L. occidentalis* *J. scopulorum* *P. tremuloides (CO)*	*C. geyeri* *A. uva-ursi* *P. virginiana* *S. oreophilus* *A. spicatum* *A. lanulosa* *A. corditolia* *Fragaria* spp.	Cooper et al. 1987 Hess and Alexander 1986 Komarkove et al. 1988 Pfister et al. 1977 Steele et al 1981
Pseudotsuga menziesii *Carex rossii* H.T.	Front Range of north-central Colorado (5,800-8,200)	Warm dry to well-drained	*P. menziesii* climax	*P. ponderosa* *J. scopulorum*	*C. rossii* *J. communis* *P. monogynus* *A. lanulosa* *C. rotundifolia* *C. fragilis*	Hess and Alexander 1986
Pseudotsuga menziesii *Arnica cordifolia* H.T. *A. cordifolia* (typic) phase *Astragalis miser* phase (ID)	Mountains of central and southwestern Montana, central and southeastern Idaho (5,900-8,600), and northwestern Wyoming (6,900-9,500)	Cool dry	*P. menziesii* climax	*P. contorta* *P. flexilis* *J. scopulorum*	*A. cordifolia* *B. repens* *J. communis* *S. oreophilus* *F. idahoensis* *P. nervosa* *A. miser* *Thalictrum occidentale*	Pfister et al. 1977 Steele et al. 1981, 1983
Pseudotsuga menziesii *Osmorhiza chilensis* H.T.	Mountains of central and southeastern Idaho, and northern Utah (5,300-7,800)	Warm moist to well-drained	*P. menziesii* climax	*P. ponderosa* *P. contorta* *A. grandis* *J. scopulorum* *P. tremuloides*	*O. chilensis* *P. myrsinites* *P. virginiana* *C. rubescens* *A. cordifolia* *S. racemosa* *Viola nuttallii*	Mauk and Henderson 1984 Steele et al. 1981, 1983
Pseudotsuga menziesii Sparse H.T. [*P. menziesii* *Berberis repens* H.T.]	Mountains of north-central Arizona (7,000-8,500)	Warm dry	*P. menziesii* climax	*P. ponderosa* *P. strobiformis*	*B. repens* *Bromus richardsonii* *P. fendleriana* (undergrowth sparse)	Alexander et al. 1984b

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
Abies concolor series						
Abies concolor/ Acer glebrum H.T. [*A. concolor-Pseudotsuga menziesii/ A. glebrum* H.T.] *A. glebrum* (typic) phase *Berberis repens* phase (AZ,NM) *Holodiscus dumosus* phase (AZ,NM) *Pachistima myrsinites* phase Riparian phase (NM)	Mountains of New Mexico, Arizona, southern Colorado (8,000-9,800), and southern Utah (7,400-8,400)	Cool moist to well-drained	*A. concolor* co-climax with *P. menziesii*, *Picea engelmannii*, *Picea pungens*, *P. ponderosa*, *P. strobiformis* minor climaxes in some phases	*P. menziesii* *P. pungens* *P. engelmannii* *P. strobiformis* *P. ponderosa* *P. flexilis* *P. tremuloides*	*A. glebrum* *A. sinuata* *A. tenuifolia* *B. repens* *H. dumosus* *P. myrsinites* *P. virginiana* *Q. gambelii* *B. ciliatus* *G. richardsonii* *S. amplexicaulis* *T. fendleri*	Alexander et al. 1984a, 1987 DeVelice et al. 1986 DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Moir and Ludwig 1979 Muldavin et al. 1986 Youngblood and Mauk 1985
Abies concolor/ Acer grandidentetum H.T. *A. grandidentetum* (typic) phase *Holodiscus dumosus* phase	Mountains of south-central and eastern Arizona, and southwestern New Mexico (6,500-8,500)	Warm moist to well-drained	*A. concolor* climax or co-climax with *P. menziesii*, *P. engelmannii*, *P. strobiformis* minor climaxes	*P. menziesii* *P. engelmannii* *P. strobiformis* *P. ponderosa* *P. tremuloides*	*A. grandidentetum* *H. dumosus* *J. major* *Q. gambelii* *C. foenea* *T. fendleri* *Viola canadensis*	Alexander et al. 1984a DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Moir and Ludwig 1979 Muldavin et al. 1988
Abies concolor/ Arctostephylos patula H.T.	Mountains of southern Utah (8,100-8,500)	Warm dry	*A. concolor* climax	*P. menziesii* *P. pungens* *P. ponderosa* *P. flexilis* *Pinus longaeva* *J. scopulorum*	*A. patula* *B. repens* *J. communis* *P. fendleri* *Q. gambelii* *S. oreophilus*	Youngblood and Mauk 1985
Abies concolor/ Arctostephylos uva-ursi H.T.	Mountains of northern New Mexico and southern Colorado (7,900-9,500)	Cool dry	*A. concolor* co-climax with *P. menziesii*	*P. menziesii* *P. ponderosa* *P. flexilis* *P. tremuloides*	*A. uva-ursi* *P. myrsinites* *J. communis* *F. ovalis* (*F. virginiana*)	DeVelice et al. 1986
Abies concolor/ Berberis repens H.T. *B. repens* (typic) phase *Juniperus communis* phase *Symphoricarpos oreophilus* phase	Mountains of Utah (5,700-9,600)	Cool dry	*A. concolor* climax	*P. menziesii* *P. pungens* *A. grandis* *P. ponderosa* *P. contorta* *P. flexilis* *P. tremuloides*	*B. repens* *J. communis* *P. myrsinites* *R. woodsii* *S. oreophilus* *Lathyrus leucanthus* *Osmorhiza* spp.	Mauk and Henderson 1984 Youngblood and Mauk 1985
Abies concolor/ Cercocarpus ledifolius H.T.	Mountains of central and southern Utah (7,000-9,400)	Warm dry	*A. concolor* climax	*P. menziesii* *P. ponderosa* *P. flexilis* *J. scopulorum*	*C. ledifolius* *A. sinuata* *B. repens* *Q. gambelii* *S. oreophilus*	Youngblood and Mauk 1985
Abies concolor/ Holodiscus dumosus H.T. (Scree forest)	Mountains of northern and southwestern New Mexico, and southern Colorado (8,000-10,000)	Cool dry	*A. concolor* co-climax with *P. menziesii*, *P. strobiformis*	*P. menziesii* *P. strobiformis* *P. ponderosa* *P. flexilis* *P. tremuloides*	*H. dumosus* *J. americana* *Ribes* spp. *B. ciliatus* *K. cristata* (*K. macrantha*) *P. fendlerlana*	DeVelice et al. 1986 Fitzhugh et al. 1987
Abies concolor/ Juglens mejor H.T.	Mountains of southern New Mexico and south-central Arizona (6,500-7,000)	Warm moist	*A. concolor* climax, *P. menziesii* minor climax	*P. menziesii* *P. ponderosa* *P. tremuloides* *P. engustifolia* *Frexinus pennsylvenica* *A. negundo*	*J. major* *Q. gambelii* *P. pretensis* *Gelium mexicenum* *T. fendleri* *V. erizonice*	Alexander et al. 1984a Fitzhugh et al. 1987 Muldavin et al. 1986
Abies concolor/ Juniperus communis H.T.	Mountains of southern Utah (7,000-9,000)	Cool dry	*A. concolor* climax	*P. menziesii* *P. pungens* *P. flexilis* *J. scopulorum* *P. tremuloides*	*J. communis* *B. repens* *R. woodsii* *S. oreophilus* *C. rossii*	Youngblood and Mauk 1985
Abies concolor/ Physocarpus melveceus H.T.	Mountains of Utah (5,000-7,000)	Warm moist	*A. concolor* climax or co-climax with *P. menziesii*	*P. menziesii* *A. grendis* *J. scopulorum* *P. tremuloides*	*P. melveceus* *A. sinifolie* *Q. gambelii* *S. oreophilus* *Mitelle sieuropetele* *S. recemose*	Mauk and Henderson 1984 Youngblood and Mauk 1985
Abies concolor/ Quercus gambelii H.T. [*A. concolor-Pseudotsuga menziesii/ Q. gambelii* H.T.] *Q. gambelii* (typic) phase *Holodiscus dumosus* phase (NM) *Festuce arizonice* phase (AZ,NM) *Muhlenbergie dubia* phase (NM) *Muhlenbergie virescens* phase (AZ,NM)	Mountains of New Mexico, Arizona, Utah, and southern Colorado (6,500-9,500)	Warm dry to well-drained	*A. concolor* co-climax with *P. menziesii*, *P. ponderosa*, *P. strobiformis* minor climaxes in some phases	*P. menziesii* *P. ponderosa* *P. strobiformis* *P. flexilis* *P. engelmannii* *J. deppeene* *J. scopulorum* *P. tremuloides*	*Q. gambelii* *B. repens* *H. dumosus* *S. oreophilus* *F. arizonice* *M. dubia* *M. virescens* *Lathyrus arizonicus* *T. fendleri*	Alexander et al. 1984a, 1987 DeVelice et al. 1986 DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Moir and Ludwig 1979 Muldavin et al. 1986 Youngblood and Mauk 1985
Abies concolor/ Robinia neomexicene H.T.	Mountains of eastern Arizona and southwestern New Mexico (8,500-9,000)	Warm dry	*A. concolor* co-climax with *P. menziesii*	*P. menziesii* *P. strobiformis* *P. ponderosa* *P. tremuloides*	*R. neomexicene* *Q. gambelii* *Rubus* spp. *C. foenee* *G. richardsonii*	Fitzhugh et al. 1987 Moir and Ludwig 1979
Abies concolor/ Symphoricarpos oreophilus H.T.	Mountains of central and southern Utah (6,800-9,300)	Warm dry to well-drained	*A. concolor* climax	*P. menziesii* *P. ponderosa* *J. scopulorum* *P. tremuloides*	*S. oreophilus* *A. sinifolie* *R. woodsii* *P. fendlerlene* *C. rossii*	Youngblood and Mauk 1985
Abies concolor/ Veccinium myrtillus H.T.	Mountains of northern New Mexico and southern Colorado (8,500-9,200)	Cool dry	*A. concolor* co-climax with *P. menziesii*, *A. lesiocarpa*, *P. engelmannii*, *P. pungens* minor climaxes	*P. menziesii* *A. lesiocarpa* *P. pungens* *P. engelmannii* *P. ponderosa* *P. flexilis* *P. tremuloides*	*V. myrtillus* *A. glebrum* *A. sinifolie* *A. uva-ursi* *B. repens* *P. myrsinites* *Rubus parviflorus*	DeVelice et al. 1986
Abies concolor/ Elymus triticoides H.T. [*A. concolor-Pseudotsuga menziesii/ E. triticoides* H.T.]	Mountains of southern New Mexico (7,500-9,500)	Warm dry to well-drained	*A. concolor* co-climax with *P. menziesii*, *P. strobiformis* minor climax	*P. menziesii* *P. strobiformis* *P. ponderosa* *P. tremuloides*	*E. triticoides* *H. dumosus* *Q. gambelii* *B. richardsonii* *M. montana*	Alexander et al. 1984a Moir and Ludwig 1979
Abies concolor/ Festuce arizonice H.T. [*A. concolor-Pseudotsuga menziesii/ Poa fendlerlana* H.T.] *F. arizonica* (typic) phase *Quercus gambelii* phase *P. fendlerlana* phase	Mountains of eastern Arizona, and northern and southwestern New Mexico (8,200-10,200)	Warm dry	*A. concolor* climax or co-climax with *P. menziesii*, *P. flexilis*	*P. menziesii* *P. flexilis* *P. ponderosa* *P. strobiformis* *P. tremuloides*	*F. arizonice* *Q. gambelii* *M. montana* *P. fendlerlana* *Erigeron* spp. *Fregerie vosca* (*F. americene*)	DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
Abies concolor/ Muhlenbergia virescens H.T.	Mountains of eastern Arizona and southwestern New Mexico (8,000-9,200)	Warm dry	*A. concolor* co-climax with *P. menziesii*	*P. menziesii* *P. strobiformis* *P. ponderosa* *P. tremuloides*	*M. virescens* *Q. gambelii* *B. ciliatus* *P. fendleriana* *C. rossii* *L. arizonicus* *Senecio* spp.	Fitzhugh et al. 1987
Abies concolor/ Carex foenea H.T.	Mountains of eastern and south-central Arizona (8,600-9,500)	Warm moist to well-drained	*A. concolor* climax	*P. menziesii* *P. ponderosa* *P. strobiformis* *P. tremuloides*	*C. foenea* *B. ciliatus* *P. pretensis* *G. richardsonii* *Fregeria* spp.	DeVelice and Ludwig 1983 Moir and Ludwig 1979 Muldavin et al. 1986
Abies concolor/ Erigeron eximius H.T. [*A. concolor-Pseudotsuga menziesii E. superbus* H.T.]	Mountains of northern and southwestern New Mexico, south-central and eastern Arizona, and Colorado (8,500-9,800)	Cool moist	*A. concolor* co-climax with *P. menziesii*, *P. engelmannii*, *P. pungens* minor climaxes	*P. menziesii* *P. engelmannii* *P. pungens* *P. ponderosa* *P. strobiformis* *P. flexilis* *P. tremuloides*	*E. eximius (E. superbus)* *B. ciliatus* *C. foenea* *F. ovalis (F. virginiana)* *H. perryi* *L. arizonicus*	DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979 Muldavin et al. 1986
Abies concolor/ Galium triflorum H.T. (Riparian forest)	Mountains of northern New Mexico and southern Colorado (7,500-9,000)	Cool moist	*A. concolor* climax	*P. menziesii* *J. scopulorum* *P. angustifolia*	*G. triflorum* *A. glabrum* *A. tenuifolia* *P. virginiana* *Q. gambelii* *P. pretensis* *T. fendleri*	DeVelice et al. 1986
Abies concolor-Pseudotsuga menziesii/ Lathyrus arizonicus H.T.	Mountains of north-central Arizona (8,000-10,000)	Cool dry	*A. concolor* co-climax with *P. menziesii*	*P. menziesii* *P. ponderosa* *P. tremuloides*	*L. arizonicus* *B. repens* *G. richardsonii*	Moir and Ludwig 1979
Abies concolor/ Osmorhiza chilensis H.T.	Mountains of northern Utah (5,400-7,000)	Warm moist to well-drained	*A. concolor* climax	*P. menziesii* *A. grandis* *P. engelmannii* *P. tremuloides*	*O. chilensis* *A. alnifolia* *P. malvaceus* *P. myrsinites* *P. virginiana*	Mauk and Henderson 1984
Abies concolor/ Sparse H.T. [*A. concolor-Pseudotsuga menziesii* H.T.] *Berberis repens* phase *Robinia neomexicana* phase	Mountains of northern and southwestern New Mexico, south-central and eastern Arizona, and southern Colorado (8,000-9,800)	Cool dry	*A. concolor* co-climax with *P. menziesii*, *P. pungens*, *P. engelmannii* minor climaxes	*P. menziesii* *P. pungens* *P. engelmannii* *P. ponderosa* *P. strobiformis* *P. flexilis* *P. aristata* *P. tremuloides*	*S. oreophilus* *B. repens* *Q. gambelii* *R. neomexicana* *B. ciliatus* (undergrowth sparse)	Alexander et al. 1984a DeVelice et al. 1986 DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Moir and Ludwig 1979 Muldavin et al. 1986

Picea pungens series

Picea pungens/ Amelanchier alnifolia H.T. (Riparian forest) [*P. pungens/A. alnifolia-Cornus stolonifera/ Carex geyeri* H.T.] [*P. pungens/Alnus tenuifolia* HT]	Mountains of central and western Colorado (6,600-8,500)	Warm moist	*P. pungens* climax	*P. menziesii* *A. lasiocarpa* *P. ponderosa* *P. tremuloides* *P. engelmannii*	*A. alnifolia* *A. tenuifolia* *C. stolonifera (Swida sericea)* *R. woodsii* *Festuca thurberi* *C. geyeri*	Hess and Wasser 1982 Hoffman 1988 Komarkova et al. 1988
Picea pungens/ Arctostaphylos uva-ursi H.T.	Mountains of northern New Mexico (7,900-9,200)	Warm dry	*P. pungens* co-climax with *P. menziesii*, *A. concolor*	*P. menziesii* *A. concolor* *P. ponderosa* *P. flexilis* *P. tremuloides*	*A. uva-ursi* *J. communis* *B. ciliatus* *F. ovalis (F. virginiana)* *S. stellata*	DeVelice et al. 1986
Picea pungens/ Berberis repens H.T. *B. repens* (typic) phase *Symphoricarpos oreophilus* phase	Mountains of Utah (7,800-9,000)	Cool dry	*P. pungens* climax, *P. menziesii* minor climax	*P. menziesii* *P. contorta* *P. ponderosa* *P. flexilis* *J. scopulorum* *P. tremuloides*	*B. repens* *J. communis* *P. myrsinites* *Ribes montigenum* *S. oreophilus* *Aquilegia caerulea* *Pyrola secunda*	Mauk and Henderson 1984 Pfister 1972 Youngblood and Mauk 1985
Picea pungens/ Cornus stolonifera H.T. [*P. pungens/ Swida sericea* H.T.] (Riparian forest)	Mountains of northern and southwestern New Mexico, and southern Colorado (7,500-9,200)	Warm moist	*P. pungens* co-climax with *P. menziesii*	*P. menziesii* *A. concolor* *P. tremuloides* *P. angustifolia*	*C. stolonifera (S. sericea)* *A. glabrum* *A. tenuifolia* *B. repens* *Salix* spp. *Calamagrostis canadensis* *C. foenea* *G. triflorum* *G. richardsonii* *S. stellata*	Alexander et al. 1987 DeVelice et al. 1986
Picea pungens/ Juniperus communis H.T.	Mountains of central Utah (8,000-8,600)	Cool dry	*P. pungens* climax	*P. menziesii* *P. ponderosa* *P. flexilis* *J. scopulorum* *P. tremuloides*	*J. communis* *A. uva-ursi* *B. repens* *P. myrsinites* *S. oreophilus*	Youngblood and Mauk 1985
Picea pungens/ Linnaea borealis H.T. [*P. pungens-Pseudotsuga menziesii* H.T. *L. borealis* phase]	Mountains of northern New Mexico and southern Colorado (8,200-9,200)	Cool moist to well-drained	*P. pungens* co-climax with *P. menziesii*, *A. concolor*, *A. lasiocarpa*, *P. engelmannii* minor climaxes	*P. menziesii* *A. concolor* *A. lasiocarpa* *P. engelmannii* *P. strobiformis* *P. flexilis* *P. tremuloides*	*L. borealis* *P. myrsinites* *R. parviflorus* *V. myrtillus* *C. foenea* *E. eximius (E. superbus)*	DeVelice et al. 1986 Moir and Ludwig 1979
Picea pungens/ Agropyron spicatum H.T.	Mountains of northern Utah (7,800-8,800)	Warm very dry	*P. pungens* climax	*P. menziesii* *P. contorta* *P. ponderosa* *P. flexilis* *J. scopulorum* *P. tremuloides*	*A. spicatum* *B. repens* *J. communis* *P. myrsinites* *S. oreophilus* *A. cordifolia*	Mauk and Henderson 1984
Picea pungens/ Festuca arizonica H.T. [*P. pungens/Carex foenea* H.T. *Pinus ponderosa* phase]	Mountains of northern and southwestern New Mexico, eastern Arizona, and southern and western Colorado (8,200-9,800)	Warm dry	*P. pungens* climax (CO) or co-climax with *P. menziesii* (AZ,NM), *A. concolor*, *P. ponderosa* minor climaxes	*P. menziesii* *A. concolor* *P. ponderosa* *P. flexilis* *P. aristata* (CO) *P. tremuloides*	*F. arizonica* *C. foenea* *A. frigida* *Erigeron* spp. *Fregeria* spp. *L. arizonicus* *Senecio* spp.	DeVelice et al. 1986 Komarkova et al. 1988 Fitzhugh et al. 1987 Moir and Ludwig 1979

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
Picea pungens/ *Poa pratensis* H.T. (Riparian forest)	Mountains of northern and southwestern New Mexico, eastern Arizona, and southern Colorado (8,000-9,100)	Warm to cool moist	*P. pungens* climax or co-climax with *P. menziesii*, *A. lasiocarpa* minor climax	*P. menziesii* *A. lasiocarpa* *A. concolor* *P. ponderosa* *P. strobiformis* *P. tremuloides*	*P. pretensis* *E. eximius* (*E. superbus*) *G. richardsonii* *F. ovalis* (*F. virginiana*)	DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979
Picea pungens/ *Poa* spp. H.T. (Not riparian)	Mountains of north-central Colorado (6,500-8,000)	Warm to well-drained	*P. pungens* climax	Usually pure stands. May contain *P. menziesii* *P. tremuloides*	*Poa* spp. *A. alnifolia* *Rosa* spp. *Salix* spp.	Hoffman and Alexander 1983
Picea pungens/ *Carex foenea* H.T. [*P. pungens/C. foenea* H.T. *Pseudotsuga menziesii* phase]	Mountains of northern and eastern Arizona, northern and southwestern New Mexico, and southern Colorado (8,000-9,500)	Cool moist to well-drained	*P. pungens* co-climax with *P. menziesii*, *A. concolor*, *P. engelmannii* minor climaxes	*P. menziesii* *A. concolor* *P. engelmannii* *P. ponderosa* *P. strobiformis* *P. flexilis* *P. tremuloides*	*C. foenea* *B. ropens* *F. arizonica* *M. montana* *B. ciliatus* *Festuca* spp. *F. ovalis* (*F. virginiana*)	Alexander et al. 1987 DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979
Picea pungens/ *Arnica cordifolia* H.T. (Riparian forest)	Front Range, north-central Colorado (7,500-9,000)	Cool moist	*P. pungens* climax	*P. menziesii* *A. lasiocarpa* *P. ponderosa* *P. contorta* *P. tremuloides*	*A. cordifolia* *J. communis* *R. woodsii* *C. canadensis* *S. stellata*	Hess and Alexander 1988
Picea pungens/ *Equisetum arvense* H.T.	Mountains of southern Utah (8,000-9,000)	Warm moist	*P. pungens* climax, *P. engelmannii* minor climax	*P. engelmannii* *P. menziesii* *P. tremuloides*	*E. arvense* *G. richardsonii* *O. chilensis* *T. fendleri*	Youngblood and Mauk 1985
Picea pungens/ *Erigeron eximius* H.T. [*P. pungens-* *Picea engelmannii* *E. superbus* H.T.] *E. eximius* (typic) phase *Pinus ponderosa* phase (AZ,NM)	Mountains of northern and southwestern New Mexico, eastern Arizona, and southern Colorado (8,000-9,800)	Cool moist to well-drained	*P. pungens* co-climax with *A. concolor*, *P. menziesii*, *P. engelmannii*, *A. lasiocarpa* minor climax	*A. concolor* *P. menziesii* *P. engelmannii* *A. lasiocarpa* *P. ponderosa* *P. strobiformis* *P. flexilis* *P. tremuloides*	*E. eximius* (*E. superbus*) *B. ciliatus* *C. foenea* *G. richardsonii* *F. vesca* (*F. americana*) *H. perryi* *T. fendleri*	DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979
Picea pungens/ *Fregeria ovalis* H.T.	Mountains of southern New Mexico (7,500-9,800)	Cool moist	*P. pungens* co-climax with *P. menziesii*, *A. concolor*, *P. engelmannii* minor climaxes	*P. menziesii* *A. concolor* *P. engelmannii* *P. strobiformis* *P. ponderosa* *P. tremuloides*	*F. ovalis* (*F. virginiana*) *A. glebrum* *H. dumosus* *B. richardsonii* *P. pratensis* *F. vesca* (*F. americana*)	Alexander et al. 1984a
Picea pungens/ *Senecio cardamine* H.T. [*P. pungens-* *Picea engelmannii* *S. cardamine* H.T.]	Mountains of eastern Arizona and southwestern New Mexico (8,800-9,200)	Cool moist	*P. pungens* co-climax with *A. lasiocarpa*, *P. engelmannii*, *A. concolor*, *P. menziesii*	*A. lasiocarpa* *P. engelmannii* *P. menziesii* *A. concolor* *P. ponderosa* *P. strobiformis* *P. tremuloides*	*S. cardamine* *F. ovalis* (*F. virginiana*) *G. richardsonii* *Helenium hoopesii* *Pteridium aquilinum* *V. canadensis*	Fitzhugh et al. 1987 Moir and Ludwig 1979
Picea pungens- *Pseudotsuga menziesii* H.T. *Arctostephylos uva-ursi* phase *Juniperus communis* phase *Valeriana acutiloba* phase	Mountains of New Mexico, Arizona, and southern Colorado (7,800-9,500)	Warm dry to well-drained	*P. pungens* co-climax with *P. menziesii*, *P. engelmannii* minor climax in some phases	*P. menziesii* *A. concolor* *P. engelmannii* *P. strobiformis* *P. ponderosa* *P. tremuloides*	*A. uva-ursi* *J. communis* *P. myrsinites* *E. eximius* (*E. superbus*) *L. arizonicus* *V. acutiloba*	Moir and Ludwig 1979
Abies grandis series						
Abies grandis/ *Acer glabrum* H.T. *A. glebrum* (typic) phase *Physocarpus malveceus* phase	Mountains of central Idaho (3,800-6,400)	Cool moist	*A. grandis* climax, *A. lasiocarpa* minor climax	*A. lasiocarpa* *P. menziesii* *P. ponderosa*	*A. glebrum* *P. malvaceus* *S. betulifolia* *S. albus* *C. rubescens*	Steele et al. 1981
Abies grandis/ *Linnaea borealis* H.T. *L. borealis* (typic) phase *Vaccinium globulare* phase (ID) *Xerophyllum tenax* phase	Mountains of northern (2,200-5,200) and central Idaho, and southern Montana (3,400-5,600)	Warm moist to well-drained	*A. grandis* climax, *A. lasiocarpa* minor climax in some phases	*A. lasiocarpa* *P. menziesii* *P. engelmannii* *P. contorta* *P. ponderosa* *L. occidentalis*	*L. borealis* *A. alnifolia* *V. globulare* *C. rubescens* *A. cordifolia* *Lupinus* spp. *X. tenax*	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981
Abies grandis/ *Pachistima myrsinites* H.T.	Mountains of northern Idaho and eastern Washington (2,600-4,900)	Cool dry to well-drained	*A. grandis* climax	*P. menziesii* *P. engelmannii* *P. contorta* *P. ponderosa* *Pinus monticola* *L. occidentalis*	*P. myrsinites* *L. borealis* *Bromus vulgaris* *G. triflorum* *S. stellata* *T. occidentale*	Daubenmire and Daubenmire 1968
Abies grandis/ *Physocarpus malveceus* H.T. *P. malveceus* (typic) phase *Coptis occidentalis* phase	Mountains of northern Idaho (2,200-5,300)	Warm dry	*A. grandis* climax	*P. menziesii* *P. contorta* *P. ponderosa* *P. monticola* *L. occidentalis*	*P. malveceus* *A. glebrum* *H. discolor* *C. occidentalis* *O. chilensis* *S. racemosa*	Cooper et al. 1987
Abies grandis/ *Spiraea betulifolia* H.T.	Mountains of northern and central Idaho (4,300-8,400)	Warm dry	*A. grandis* climax	*P. menziesii* *P. ponderosa* *P. tremuloides*	*S. betulifolia* *S. albus* *C. rubescens* *A. cordifolia*	Cooper et al. 1987 Steele et al. 1981
Abies grandis/ *Vaccinium caespitosum* H.T.	Mountains of central Idaho (4,600-5,500)	Cool moist to well-drained frost pockets	*A. grandis* climax, *A. lasiocarpa* minor climax	*A. lasiocarpa* *P. menziesii* *P. engelmannii* *P. contorta* *P. ponderosa* *L. occidentalis*	*V. caespitosum* *C. rubescens* *C. geyeri* *F. ovalis* (*F. virginiana*) *T. occidentale*	Steele et al. 1981
Abies grandis/ *Vaccinium globulare* H.T.	Mountains of northern and central Idaho (4,500-8,500)	Cool moist	*A. grandis* climax, *A. lasiocarpa* minor climax	*A. lasiocarpa* *P. menziesii* *P. engelmannii* *P. ponderosa* *P. contorta* *L. occidentalis*	*V. globulare* *Lonicera utahensis* *S. betulifolia* *C. rubescens* *C. geyeri* *C. rossii*	Cooper et al. 1987 Steele et al. 1981
Abies grandis/ *Calamagrostis rubescens* H.T.	Mountains of central Idaho (5,200-8,100)	Cool dry	*A. grandis* climax	*P. menziesii* *P. contorta* *P. ponderosa* *L. occidentalis*	*C. rubescens* *S. betulifolia* *C. geyeri* *A. cordifolia*	Steele et al. 1981
Abies grandis/ *Asarum caudatum* H.T. *A. caudatum* (typic) phase *Menziesii ferruginea* phase *Taxis brevifolia* phase	Mountains of northern Idaho (2,200-5,950)	Warm moist	*A. grandis* climax, *A. lasiocarpa* may be minor climax	*A. lasiocarpa* *P. engelmannii* *P. menziesii* *P. contorta* *P. monticola* *L. occidentalis*	*A. caudatum* *H. discolor* *M. ferruginea* *T. brevifolia* *C. uniflora* *C. occidentalis*	Cooper et al. 1987

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
Abies grandis/ *Clintonia uniflora* H.T. *C. uniflora* (typic) phase *Menziesia ferruginea* phase (ID) *Physocarpus malvaceus* phase (ID) *Taxis brevifolia* phase (ID) *Aralia nudicaulis* phase (MT) *Xerophyllum tenax* phese	Mountains of northern Montana, and northern and central Idaho (2,000-6,100)	Warm moist	*A. grandis* climax. *A. lasiocarpa* minor climax	*A. lasiocarpa* *P. menziesii* *P. engelmannii* *P. contorta* *P. ponderose* *P. monticola* *L. occidentalis*	*C. uniflora* *A. glabrum* *L. borealis* *M. ferruginea* *P. malvaceus* *T. brevifolia* *V. globulare* *B. vulgaris* *A. nudicaulis* *G. triflorum* *X. tenax*	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981
Abies grandis/ *Coptis occidentalis* H.T.	Mountains of central Idaho (1,600-6,000)	Warm dry	*A. grandis* climax	*P. engelmannii* *P. menziesii* *P. contorta* *P. ponderosa* *L. occidentalis*	*C. occidentalis* *S. albus* *V. globulara* *X. tenax*	Steele et al. 1981
Abies grandis/ *Senecio triangularis* H.T.	Mountains of northern Idaho (2,600-4,600)	Warm moist	*A. grandis* climax. *A. lasiocarpa* may be minor climax	*A. lasiocarpa* *P. menziesii* *P. engelmannii* *L. occidentalis*	*S. triangularis* *Athyrium filix-femina* *Circaea alpina* *C. occidentalis* *Trautvettera carolinensis*	Cooper et al. 1987
Abies grandis/ *Xerophyllum tenax* H.T. *X. tenax* (typic) phese *Vaccinium globulere* phase (ID) *Coptis occidentalis* phase (ID)	Mountains of northern and central Idaho, and northwestern Montana (4,400-6,500)	Cool dry	*A. grandis* climax. *A. lesiocarpa* minor climax	*A. lasiocarpa* *P. menziesii* *P. engelmannii* *P. contorta* *P. ponderosa* *L. occidentalis*	*X. tenax* *P. myrsinites* *V. globulare* *Vaccinium scoparium* *C. rubescans* *Arnica latifolia* *C. occidentalis*	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981
Thuja plicata series						
Thuja plicatel *Oplopenax horridum* H.T.	Mountains of Montana, northern Idaho, and eastern Washington (1,600-4,900)	Cool moist	*T. plicata* climax or co-climax with *T. heterophylla*. *A. lasiocarpa* may be minor climax	*T. heterophylla* *A. lasiocarpa* *P. menziesii* *P. engelmannii* *A. grandis* *P. monticole* *L. occidentalis*	*O. horridum* *A. filix-femina* *Dryopteris dilatate* *S. triangularis* *S. stellata* *Streptopus amplexifolius* *Tiarella* spp.	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Pfister et al. 1977
Thuja plicatel *Pechistima myrsinites* H.T.	Mountains of northern Idaho and eestern Washington (2,600-4,700)	Coot dry to wall-drained	*T. plicate* climax	*P. engelmannii* *P. menziesii* *A. grandis* *P. monticole* *L. occidentalis*	*P. myrsinites* *A. glabrum* *C. occidentalis* *Disporum oregonum* *G. triflorum* *S. stellata*	Daubenmire and Daubenmire 1968
Thuja plicatal *Adientum pedatum* H.T.	Mountains of northern Idaho (≤3,000)	Cool moist	*T. plicete* climax. *T. heterophylla* minor climax	*T. heterophylle* *A. grendis* *P. monticole* *L. occidentelis*	*A. pedatum* *A. filix-femina* *C. uniflora* *D. dilatata*	Cooper et al. 1987
Thuja plicatal *Asarum caudatum* H.T. *A. caudatum* (typic) phase *Menziesia ferruginea* phase *Taxis brevifolia* phase	Mountains of northern Idaho (2,200-5,200)	Warm moist	*T. plicata* climax	*A. lesiocarpe* *P. engelmanni* *A. grandis* *P. menziesii* *P. contorta* *P. monticole* *P. ponderosa* *L. occidentalis*	*A. caudatum* *A. glabrum* *M. ferruginea* *T. brevifolia* *C. occidentalis* *Polystichum munitum* *P. aquilinum* *Viola glabella*	Cooper et al. 1987
Thuja plicatal *Athyrium filix-femina* H.T. *A. filix-femina* (typic) phase *Adiantum pedatum* phase (ID)	Mountains of northern Idaho and eastern Washington (1,500-4,700)	Warm moist to wet	*T. plicata* climax or co-climax with *T. heterophylla*	*T. heterophylla* *P. engelmannii* *P. menziesii* *A. grandis* *P. monticola*	*A. filix-femina* *A. pedatum* *G. triflorum* *S. triangularis* *S. ampiexifolius*	Cooper et al. 1987 Daubenmire and Daubenmire 1968
Thuja plicatel *Clintonia uniflora* H.T. *C. uniflora* (typic) phase *Menziesia ferruginea* phase *Taxis brevifolia* phase (ID) *Aralia nudicaulis* phase (MT) *Xerophyllum tenax* phase (ID)	Mountains of northern Idaho and northwestern Montana (1,500-5,500)	Warm dry bottomlands	*T. plicata* climax. *A. lasiocarpa* *A. grandis* *T. heterophylla* minor climaxes	*A. lasiocarpa* *A. grandis* *T. heterophylle* *P. engelmennii* *P. menziesii* *P. contorta* *L. occidentalis*	*C. uniflora* *L. boreelis* *M. terruginea* *V. globulere* *T. brevifolia* *A. nudicaulis* *X. tenax*	Cooper et al. 1987 Pfister et al. 1977
Thuja plicatel *Gymnocarpium dryopteris* H.T.	Mountains of northern Idaho (3,200-4,500)	Coot dry	*T. plicata* climax	*P. engelmannii* *P. menziesii* *A. grandis* *P. monticola*	*G. dryopteris* *A. pedatum* *A. filix-femina* *C. uniflora*	Cooper et al. 1987
Tsuga heterophylla series						
Tsuga heterophylla/ *Menziesia ferruginea* H.T.	Mountains of northern Idaho (±5,000)	Warm well-drained	*T. heterophylla* climax	*A. lasiocarpa* *P. engelmennii*	*M. ferruginea* *V. globulare* *X. tenex*	Cooper et al. 1987
Tsuga heterophylla/ *Pechistima myrsinites* H.T.	Mountains of northern Idaho and eastern Washington (2,700-3,900)	Cool moist	*T. heterophylla* climax	*T. plicata* *P. menziesii* *A. grandis* *P. monticola* *L. occidentalis*	*P. myrsinites* *L. borealis* *Vaccinium membranaceum* *C. unitiore* *G. dryopteris*	Daubenmire and Daubenmire 1968
Tsuga heterophylla/ *Asarum caudatum* H.T. *A. caudetum* (typic) phase *Menziesia ferruginea* phase *Aralia nudicaulis* phase	Mountains of northern Idaho (2,200-5,000)	Warm well-drained	*T. heterophylla* climax	*A. lasiocarpe* *P. engelmannii* *P. menziesii* *A. grandis* *P. monticole* *P. contorta* *L. occidenteils* *T. pliceta*	*A. caudatum* *L. boreelis* *M. ferruginea* *P. myrsinites* *A. nudicaulis* *C. uniflore* *C. occidentalis* *P. hookeri*	Cooper et al. 1987
Tsuga heterophylla/ *Clintonia uniflora* H.T. *C. uniflora* (typic) phase *Menziesia ferruginea* phase (ID) *Aralia nudicaulis* phase *Xerophyllum tenax* phase (ID)	Mountains of northern Idaho and northwestern Montana (2,000-4,500)	Warm moist to well-drained	*T. heterophylla* climax. *A. lasiocarpa* *A. grandis* *T. plicete* minor climaxes	*A. lasiocarpa* *A. grandis* *T. plicata* *P. engelmannii* *P. menziesii* *P. contorta* *P. monticola* *L. occidenlails*	*C. uniflora* *M. ferruginea* *T. brevifolie* *V. globulare* *V. membraneceum* *A. nudicaulis* *X. tenex*	Cooper et al. 1987 Pfister et al. 1977
Tsuga heterophylla/ *Gymnocarpium dryopteris* H.T.	Mountains of northern Idaho (2,500-4,500)	Warm dry to well-dreined	*T. heterophylla* co-climax with *T. plicata*	*T. plicata* *P. engelmannii* *A. grandis* *P. monticole* *L. occidentalis*	*G. dryopteris* *A. caudatum* *C. uniflora* *C. occidentalis* *S. stellata*	Cooper et al. 1987
Pinus flexilis series						
Pinus flexilis/ *Arctostaphylos uva-ursi* H.T.	Mountains of northern New Mexico and southern Colorado (9,500-10,000)	Cool dry	*P. flexilis* co-climex with *P. menziesii*. *P. engelmannii* minor climax	*P. menziesii* *P. engelmannii* *P. tremuloides*	*A. uve-ursi* *J. communis*	DeVelice et al. 1986
Pinus flexilis/ *Berberis repens* H.T.	Mountains of northern Utah (6,500-7,000)	Werm dry	*P. flexilis* climex	*P. menziesii* *J. scopulorum*	*B. repens* *P. myrsinites* *P. virginiana* *S. oreophilus* *A. spicatum*	Meuk and Henderson 1984

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Trees associated	Principal undergrowth species	Authority
Pinus flexilis/ Carcocerpus ledifolius H.T.	Mountains of southeastern Idaho and northern Utah (7,000-8,700)	Warm dry	*P. flexilis* climax or co-climax with *P. menziesii. J. scopulorum* minor climax	*P. menziesii J. scopulorum*	*C. ledifolius B. repens S. oreophilus A. spicatum H. kingii B. sagittate*	Mauk and Henderson 1984 Steele al al. 1983
Pinus flexilis/ Juniperus communis H.T.	Mountains of Montana (4,600-8,300), northwastern Wyoming (7,000-9,500), southeestern Wyoming, end central and western Coloredo (8,300-9,300)	Warm dry	*P. flexilis* climax. *P. menziesii P. contorte P. albicaulis* minor climaxes	*P. menziesii P. contorta P. albicaulis P. engelmannii P. ponderosa P. tremuloides*	*J. communis A. uva-ursi S. canadensis C. purpurascens C. rossii A. cordifolie*	Alexander et al. 1986 Hess and Alexander 1986 Hoffman 1988 Hoffman and Alexander 1980 Pfister el al. 1977 Steele et al. 1983
Pinus flexilis Agropyron spicatum H.T.	Mountains of Montana east of Continental Divide (4,400-6,600)	Warm very dry	*P. flexilis* climax or co-climax with *J. scopulorum. P. ponderose* minor climax	*P. ponderose J. scopulorum*	*A. spicatum B. gracilis H. kingii K. cristata (K. mecrentha) Carex* spp.	Pfister et al. 1977
Pinus flexilis/ Calamagrostis purpurascens H.T.	Mountains of north-central Colorado (9,700-11,000)	Cool dry	*P. flexilis* climax	Usually pure stands. May contain *P. engelmannii P. contorte*	*C. purpurascens Arenaria fendleri Erigeron* spp. *Pulsatilla ludoviciene*	Hess and Alexander 1986
Pinus flexilis/ Festuca idahoensis H.T. *F. idahoensis* (lypic) phase *Festuce scebrelle* phase (MT)	Mountains of southwestern Montana, central Idaho, and northwestern Wyoming (4,800-8,300)	Warm dry	*P. flexilis* co-climax with *P. menziesii. J. scopulorum* minor climax	*P. menziesii J. scopulorum*	*F. idahoensis A. tridenteta A. scipetum H. kingii F. scebrella B. sagiteta*	Pfister et al. 1977 Staele et al. 1981, 1983
Pinus flexilis/ Hesperochloa kingii H.T.	Mountains of northwestern and southeastern Wyoming (7,200-9,300)	Werm dry	*P. flexilis* climax or co-climax with *P. menziesii. P. scopulorum* minor climax	Usually pure stands (SE WY). Mey contain (NW WY) *P. menziesii J. scopulorum*	*H. kingii A. spicatum K. cristata C. rossii A. misar B. sagittata*	Alexander el al. 1986 Sleele el al. 1983
Pinus flexilis/ Saxifraga bronchialis H.T. [*P. flexilis/ Ciliaria eustromontana* H.T.]	Mountains of south-central Colorado (8,500-9,500)	Cool dry	*P. flexilis* climax	*P. menziesii*	*S. bronchialis (C. austromontana) J. communis R. woodsii S. oreophilus F. thurberi*	Komarkova et al. 1988
Pinus flexilis/ Trifolium dasyphyllum H.T.	Mountains of north-central Colorado (11,000-11,500)	Cool dry to well-drained	*P. flexilis* climax	Usually pure stands. May contain *P. engelmannii A. lasiocarpa*	*T. desyphyllum C. foenea A. fendleri Mertensia viridis Oreoxis alpina*	Hess and Alexander 1986
Pinus flexilis- Pinus longaeva H.T.	Mountains of central and southern Utah (9,000-10,200)	Cool dry	*P. flexilis* co-climax with *P. longaeva. P. menziesii J. scopulorum* minor climexes	*P. longaeve P. manziesii J. scopulorum P. tremuloides*	*S. oreophilus B. repens J. communis A. patula C. rossii A. miser*	Youngblood and Mauk 1985
Populus tremuloides series and other _P. tremuloides_-dominated vegetation						
Populus tremuloides/ Acer glebrum C.T. (Riparian forest)	Mountains of south-central Colorado (9,000-9,200)	Warm wet	*P. tremuloides* climax or sieble	*P. engelmannii Populus balsamifera*	*A. glabrum B. repens R. montigenum O. depauperete T. fendleri*	Powell 1987
Populus tremuloides- Abies lasiocarpe/ Amelanchier alnifolia C.T.	Mountains of eastern Idaho and Utah (5,800-7,800)	Cool dry	*P. tremuloides* serel to *A. lasiocarpe P. engelmannii*	*A. lasiocarpe P. engelmannii*	*A. alnifolia P. virginiane S. oreophilus Aster engelmannii O. chilensis T. fendleri*	Mueggler 1987
Populus tremuloides- Pseudotsuga menziesii Amelanchier alnifolia C.T.	Mountains of northern Utah and southeastern Idaho (5,600-7,500)	Warm dry	*P. tremuloides* serel to *P. menziesii*	*P. menziesii*	*A. alnifolia B. repens P. virginiana S. betulifolia S. oreophilus Agropyron trechycaulum Elymus glaucus T. fendleri*	Mueggler 1987
Populus tremuloides/ Amelanchier alnifolia C.T. [*P. tremuloides/A. alnifolia- Prunus virginiana* H.T.(CO)] [*P. tremuloides/A. alnifolia- Symphoricarpos oreophilus/ Bromus cerinatus* C.T.] [*P. tremuloides/A. alnifolia- S. oreophilus/ Calamagrostis rubescens* C.T.] [*P. tremuloides/A. alnifolia- S. oreophilus/ Thalictrum fendleri* C.T.] [*P. tremuloides/A. alnifolia- S. oreophilus*/tall forb C.T.] [*P. tremuloidas/A. alnifolia- Pteridium aquilinum* C.T.] [*P. tremuloides/A. alnifolia- T. fendleri* C.T.] [*P. tremuloides/A. alnifolia-* tall forb C.T.]	Mountains of southeastern Idaho, Utah, Nevada, western Wyoming (5,500-8,800), and-central and western Colorado (8,000-8,500)	Warm dry	*P. tremuloides* climax (CO). Stable or grazing disclimex (ID,NE, UT,WY)	Usually pure stands	*A. alnifolia A. glabrum A. grandidantatum P. myrsinites P. virginiane Q. gambelii S. betulifolia S. oreophilus C. rubascens B. carinelus C. geyeri A. engelmannii Gerenium viscosissimum O. chilensis P. equilinum T. fendleri*	Johnston and Hendzel 1985 Komarkova el al. 1988 Mueggler 1987
Populus tremuloides- Abies concolor/ Arctostephylos patula C.T.	Mountains of eastern Nevada (8,300-9,500)	Warm dry	*P. tremuloidos* seral to *A. concolor*	*A. concolor P. monziesii*	*A. petula B. repens P. fendleriana C. rossii Penstomon watsoni S. jamesiana*	Mueggler 1987
Populus tremuloides/ Arctostaphylos uva-ursi H.T.; C.T.	Mountains of south-central Colorado; Front Range, Colorado (9,500-10,500)	Cool dry	*P. tromuloidos* climax or serel to *P. contorta P. flexilis*	Usually pure stands. Mey contain *P. contorta P. flexilis A. lasiocarpa P. engelmannii*	*A. uva-ursi J. communis S. oreophilus Bromus portori C. foenoe Carex geophila*	Komarkova et al. 1988 Powell 1987 Radloft 1983

Tabla A1.—Continuad.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associatas	Principal undergrowth speclas	Authority
Populus tramuloidesl Artamisia tridentata C.T.	Mountains of southaastern Idaho, Utah, Nevada, and western Wyoming (8,900-9,400)	Warm dry	*P. tremuloidas* stabla or seral to unknown ultimate climax	Usually pure stands	*A. tridentata* *J. communis* *S. oraophilus* *B. ciliatus* *S. occidantalis* *Taraxicum officinale*	Mueggler 1987
Populus tremuloidesl Barberis rapens H.T.	Mountains of southwastern North Dakota, and southeastern Montana (3,500-4,000)	Warm dry to wall-drainad	*P. tremuloidas* climax	Usually pure stands. May contain *A. nagundo* *F. pannsylvanica*	*B. rapans* *A. glabrum* *P. virginiana* *S. albus* *P. pratansis* *G. boraala*	Hansen and Hollman 1988
Populus tremuloidesl Betula occidentalis H.T.	Theodore Roosevalt National Park, North Dakota (2,400-2,800)	Warm well-drained	*P. tramuloides* climax	*J. scopulorum* *A. negundo* *Crataegus chrysocarpa* *F. pannsylvanica* *Ulmus americana*	*B. occidantalis* *P. virginiana* *Symphoricarpos* spp. *Toxicodandron rydbergii* *D. micrantha* *Apocynum androsaemifolium*	Hansen et al. 1984
Populus tremuloides-Corylus cornuta H.T.(SD,WY); C.T.(CO) *Aralia nudicaulis* phase (SD) *Pteridium aquilinum* phasa (SD)	Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (3,900-6,300); Front Ranga, Colorado (≥8,000)	Warm moist to well-drainad	*P. tremuloidas* climax (SD,WY). Stable or seral (CO) to *P. manziasii* *P. pungens*	*P. manziasii* (CO) *P. pungens* (CD) *Betula papyrifara*	*C. cornuta* *S. arbus* *A. nudicaulis* *Astar ciliolatus* *G. trifiorum* *O. chilansis* *P. aquilinum* *V. canadansis*	Hoffman and Alexander 1987 Powell 1987
Populus tremuloides-Ables lasiocarpa/ Juniperus communis C.T.	Mountains of northern Utah and eastern Nevada (8,000-10,000)	Cool dry	*P. tramuloides* saral to *A. lasiocarpa* *P. engalmannii*	*A. lasiocarpa* *P. engalmannii*	*J. communis* *B. repens* *S. oreophilus* *Bromus* spp. *S. occidentalis* *A. millafolium* *F. vesca (F. americana)* *T. officinale*	Mueggler 1987
Populus tremuloidas-Pseudotsuga menziasii/ Juniperus communis C.T.	Mountains of northern Utah, plateaus of southarn Utah, and mountains of eastern Nevada (7,500-9,200)	Warm dry	*P. tremuloides* seral to *P. menziesii*	*P. menziesii*	*J. communis* *B. repens* *S. oreophilus* *A. trachycaulum* *S. occidentalis* *Antennaria microphylla* *A. miser* *T. tendieri*	Mueggler 1987
Populus tremuloides-Pinus contorta/ Juniperus communis C.T.	Mountains of northern Utah (≥8,000)	Cool dry	*P. tremuloides* seral to unknown ultimate climax. Probably *A. lasiocarpa* *P. manziesii*	*A. lasiocarpa* *P. manziesii* *P. angalmannii* *P. contorta*	*J. communis* *B. repans* *S. oraophilus* *A. trachycaulum* *C. geyeri* *A. millafolium* *A. miser* *L. argenteus*	Mueggler 1987
Populus tremuloidas/ Juniparus communis H.T.(UT); C.T.(CO,UT,WY) [*P. tremuloides/J. communis-Carex geyeri* C.T.(UT)] [*P. tremuloides/J. communis-Astragalus misar* C.T.(UT)] [*P. tremuloides/J. communis-Lupinus argenteus* C.T.(UT,WY)]	Mountains of wastern Wyoming, southeastern Idaho, and Utah (8,000-9,000); Front Range, central Colorado (9,000-9,500)	Cool dry	*P. tramuloides* climax, stable, or seral to unknown ultimata climax. Probably *P. menziesii*	Usually pura stands. May contain *P. manziesii* *A. lasiocarpa* (CO) *P. engelmannii* (CD) *P. pungans* (CD) *P. contorta* *P. flexilis*	*J. communis* *B. repens* *R. woodsii* *S. canadensis* *S. oreophilus* *S. hystrix* *Stipa* spp. *C. geyeri* *C. rossii* *A. misar* *L. argenteus*	Mauk and Henderson 1984 Mueggler 1987 Powell 1987 Radloff 1983
Populus tremuloidesl Lonicera involucrata C.T.	Front Range, central Colorado (9,700-10,200)	Cool moist to well-drained	*P. tramuloides* saral to *A. lasiocarpa* *P. engelmannii*	*A. lasiocarpa* *P. angelmannii* *P. balsamifera*	*L. involucrata* *R. montigenum* *R. woodsii* *B. porteri* *C. foenea* *F. ovalis (F. virginiana)*	Powell 1987 Radloff 1983
Populus tremuloidesl Physocarpus monogynus C.T.	Front Range, centrat Colorado (8,500-9,500)	Cool moist	*P. tramuloides* saral to *P. menziesii*	*P. menziasii* *P. engalmannii* *P. contorta*	*P. monogynus* *S. oreophilus* *B. ciliatus* *Dryzopsis asperifolia* *G. boreale*	Powell 1987
Populus tremuloidasl Ribes montigenum C.T. (Riparian forest)	Mountains of south-central Colorado (9,760-10,600)	Cool moist	*P. tremuloides* sarat to *P. angalmannii*	*P. angelmannii* *P. menziasii*	*R. montiganum* *Betula frontinalis* *B. rapens* *R. woodsii* *P. aquilinum*	Powell 1987
Populus tramuloidesl Rubus parviflorus H.T.(CD); C.T.(ID,UT,WY)	Mountains of southaastern Idaho, western Wyoming, Utah (8,000-9,300), and western Colorado (8,000-10,000)	Cool moist	*P. tremuloides* climax (CD). Stable or saral to unknown ultimate climax (ID,UT,WY). Probably *A. lasiocarpa* *P. menziasii*	Usually pure slands. May contain *A. lasiocarpa* *P. manziasii* *P. contorta* (ID,UT,WY)	*R. parviflorus* *A. glabrum* *P. myrsinites* *S. oreophilus* *V. myrtillus* *A. cordifolia* *G. viscossisimum* *D. chilensis*	Hollman 1988 Muaggler 1987
Populus tramuloidesl Salix scouleriana C.T.	Mountains of southeastern Idaho, northern Utah, and aastarn Nevada (5,800-7,400)	Warm to well-drained	*P. tremuloides* stable. May be climax	Usually pura stands	*S. scouleriana* *A. alnifolia* *P. virginiana* *S. oreophilus* *B. carinatus* *E. glaucus* *O. chilansis* *T. landlari*	Mueggler 1987
Populus tramuloidesl Sambucus racemosa C.T.	Mountaina of Utah (8,000-10,500)	Cool dry	*P. tramuloidas* stable or saral to unknown ultimate climax. Probably *A. lasiocarpa*	Usually pure stands. May contain *A. lasiocarpa*	*S. racemosa* *Sambucus ceurla* *A. trachycaulum* *B. carinatus* *Martansia arizonica* *D. occidantalis* *Rudbackia occidantalis* *T. landlari*	Mueggler 1987
Populus tramuloidas-Abies lasiocarpa/ Shephardia canadansis C.T.	Mountains of western Wyoming, southeastern Idaho, and norlhern Utah (7,000-8,300)	Cool dry to well-drained	*P. tramuloides* seral to *A. lasiocarpa* *P. engalmannii*	*A. lasiocarpa* *P. engelmannii* *P. contorta* *P. flexilis*	*S. canadansis* *B. repans* *R. woodsii* *E. glaucus* *A. cordifolia* *O. chilensis* *T. tendlari*	Mueggler 1987

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
Populus tremuloides/ *Shepherdia canadensis* C.T.	Mountains of southeastern Idaho and western Wyoming (8,000-9,000); Front Range, central Colorado (9,000-10,000)	Cool dry to well-drained	*P. tremuloides* seral to unknown ultimate climax. Probably *A. lasiocarpa* *P. engelmannii* *P. menziesii*	*A. lasiocarpa* *P. engelmannii* *P. menziesii* *P. contorta* *P. flexilis*	*S. canadensis* *B. repens* *J. communis* *R. woodsii* *B. ciliatus* *G. boreale* *G. viscosissimum* *L. argenteus* *O. chilensis*	Powell 1987 Mueggler 1987
Populus tremuloides- *Abies lasiocarpa/* *Symphoricarpos oreophilus* C.T. [*P. tremuloides-A. lasiocarpa/* *S. oreophilus-* *Bromus carinatus* C.T.] [*P. tremuloides-A. lasiocarpa/* *S. oreophilus-* *Thalictrum fendleri* C.T.] [*P. tremuloides-A. lasiocarpa/* *S. oreophilus*-tall forb C.T.]	Mountains of southeastern Idaho, northern Utah, and western Wyoming (7,000-9,000)	Warm dry to well-drained	*P. tremuloides* seral to unknown ultimate climax. Probably *A. lasiocarpa*	May be pure stands. Usually contain *A. lasiocarpa* *A. concolor* *P. menziesii*	*S. oreophilus* *A. alnifolia* *A. tridentata* *B. repens* *P. virginiana* *B. carinatus* *C. rubescens* *E. glaucus* *P. pratensis* *C. geyeri* *G. viscosissimum* *L. argenteus* *R. occidentalis* *Senecio serre* *T. fendleri*	Mueggler 1987 Steele et al. 1983
Populus tremuloides- *Abies concolor/* *Symphoricarpos oreophilus* C.T.	Mountains of northern Utah and eastern Nevada (7,000-9,000)	Warm dry	*P. tremuloides* seral to *A. concolor*	*A. concolor* *P. pungens*	*S. oreophilus* *B. repens* *R. woodsii* *A. trachycaulum* *E. glaucus* *A. engelmannii* *R. occidentalis* *O. chilensis* *S. serra*	Mueggler 1987
Populus tremuloides- *Pseudotsuga menziesii/* *Symphoricarpos oreophilus* C.T.	Mountains of southeastern Idaho and northern Utah (6,000-7,500)	Warm dry	*P. tremuloides* seral to *P. menziesii*	*P. menziesii* *A. lasiocarpa* *P. contorta*	*S. oreophilus* *R. woodsii* *C. rubescens* *E. glaucus* *G. viscosissimum* *L. argenteus* *T. fendleri*	Mueggler 1987
Populus tremuloides- *Pinus contorta/* *Symphoricarpos oreophilus* C.T.	Mountains of southeastern Idaho and northern Idaho (5,700-9,800)	Warm dry	*P. tremuloides* seral to unknown ultimate climax	*P. contorta*	*S. oreophilus* *P. myrsinites* *C. rubescens* *C. geyeri* *G. viscosissimum* *O. chilensis* *T. fendleri*	Mueggler 1987
Populus tremuloides/ *Symphoricarpos oreophilus* H.T., C.T.(CO);C.T.(ID,UT,NE,WY) [*P. tremuloides/S. oreophilus-* *Wyethia amplexicaulis* C.T.]	Mountains of Utah, southeastern Idaho, northwestern Wyoming, eastern Nevada (7,000-9,000), and central and western Colorado (8,000-10,000)	Warm moist to well-drained	*P. tremuloides* climax (CO). Stable or seral to unknown ultimate climax (CO,UT,ID,WY). Probably *A. lasiocarpa* *P. menziesii*	Usually pure stands. Seral stands in CO may contain *A. lasiocarpa* *P. menziesii* *P. engelmannii* *P. contorta* *P. ponderosa*	*S. oreophilus* *B. repens* *P. myrsinites* *O. gambelii* *W. amplexicaulis* *B. carinatus* *C. rubescens* *F. thurberi* *P. pratensis* *C. geyeri* *C. rossii* *A. engelmannii* *M. arizonica* *R. occidentalis* *S. sarra* *T. fendleri*	Hess and Wasser 1982 Hoffman 1988 Hoffman and Alexander 1980, 1983 Johnston and Handzel 1985 Komarkova et al. 1988 Mauk and Henderson 1984 Mueggler 1987 Powell 1987
[*P. tremuloides/S. oreophilus-* *Bromus carinatus* C.T.] [*P. tremuloides/S. oreophilus-* *Calamagrostis rubescens* C.T.] [*P. tremuloides/S. oreophilus-* *Festuca thurberi* C.T.(UT)] [*P. tremuloides/S. oreophilus-* *Poa pratensis* C.T.(NE,UT)] [*P. tremuloides/S. oreophilus-* *Carex geyeri* H.T.(CO)] [*P. tremuloides/S. oreophilus-* *Carex rossii* C.T.] [*P. tremuloides/S. oreophilus-* *Thalictrum fendleri* C.T.] [*P. tremuloides/S. oreophilus-* tall forb C.T.]						
Populus tremuloides/ *Vaccinium caespitosum* C.T.	Front Range, central Colorado (7,600-7,800)	Cool moist to well-drained	*P. tremuloides* seral to *P. menziesii*	*P. menziesii*	*V. caespitosum* *A. glabrum* *A. alnifolia* *R. woodsii* *E. glaucus* *A. cordifolia*	Powell 1987
Populus tremuloides/ *Vaccinium myrtillus* C.T.	Front Range, central Colorado (9,000-10,500)	Cool dry	*P. tremuloides* seral to *A. lasiocarpa* *A. concolor* *P. engelmannii*	*A. lasiocarpa* *A. concolor* *P. engelmannii*	*V. myrtillus* *B. repens* *P. monogynus* *V. scoparium* *A. cordifolia*	Powell 1987
Populus tremuloides/ *Wyethia amplexicaulis* C.T.	Mountains of southeastern Idaho, Utah, eastern Nevada, and western Wyoming (≤7,000)	Cool well-drained	*P. tremuloides* stable or seral to unknown ultimate climax	Usually pure stands	*W. amplexicaulis* *B. carinatus* *P. pratensis* *G. viscosissimum* *R. occidentalis* *S. sarra*	Mueggler 1987
Populus tremuloides/ *Bromus carinatus* C.T.	Mountains of southeastern Idaho, Utah, eastern Nevada, and western Wyoming (6,200-10,000)	Warm to cool dry	*P. tremuloides* stable or seral to unknown ultimate climax. May be grazing disclimax	Usually pure stands	*B. carinatus* *A. trachycaulum* *E. glaucus* *P. pratensis* *A. millefolium* *R. occidentalis* *T. fendleri* *V. americana*	Mueggler 1987
Populus tremuloides/ *Bromus ciliatus* C.T.	Front Range, central Colorado (9,000-10,200)	Cool moist	*P. tremuloides* seral to *A. concolor* *A. lasiocarpa* *P. engelmannii*	*A. concolor* *A. lasiocarpa* *P. engelmannii* *P. menziesii* *P. pungens* *P. contorta*	*B. ciliatus* *A. uva-ursi* *J. communis* *F. thurberi* *Poa* spp. *G. boreale* *S. stellata*	Powell 1987
Populus tremuloides/ *Calamagrostis canadensis* C.T.	Front Range, central Colorado (9,000-10,500)	Cool moist	*P. tremuloides* seral to *A. lasiocarpa* *P. engelmannii*	*A. lasiocarpa* *P. engelmannii* *A. concolor* *P. menziesii* *P. contorta*	*C. canadensis* *R. woodsii* *P. pratensis* *Ligusticum porteri* *S. triangularis* *V. canadensis*	Powell 1987 Radloff 1983
Populus tremuloides- *Pseudotsuga menziesii/* *Calamagrostis rubescens* C.T.	Mountains of southeastern Idaho and western Wyoming (8,400-7,800)	Cool dry	*P. tremuloides* seral to *P. menziesii*	*P. menziesii* *P. contorta*	*C. rubescens* *S. oreophilus* *E. glaucus* *C. geyeri* *A. cordifolia* *L. argenteus* *O. chilensis* *T. fendleri*	Mueggler 1987

Teble A1.—Continued.

Hebitet type or community type	Locetion and elevetion (feet)	Site	Successional stetus	Tree essocietes	Principel undergrowth species	Authority
Populus tremuloides/ Calamagrostis rubescens H.T. (SE WY);C.T.(NW WY,ID,UT)	Mounteins of southeastern Idaho, Uteh, and northwestern end southeastern Wyoming (8,000-8,600)	Cool dry	*P. tremuloides* climex (SE WY). Steble or seral to unknown ultimete climax (NW WY,ID,UT). Probebly *A. lesiocarpa* *P. menziesii*	Usually pure stands (SE WY). Mey contein *A. lesiocarpa* *P. menziesii* *P. contorta* (NW WY,ID,UT)	*C. rubescens* *S. oreophilus* *P. pratensis* *C. geyeri* *Fragaria* spp. *G. viscosissimum* *O. chilensis* *T. fendleri*	Alexender et al. 1986 Mueggler 1987
Populus tremuloides/ Elymus glaucus C.T.	Front Renge, centrel Coloredo (9,500-10,000)	Cool wet	*P. tremuloides* seral to *A. lasiocarpa* *P. engelmannii*	*A. lasiocarpa* *P. engelmannii*	*E. glaucus* *B. ciliatus* *P. pratensis* *Aconitum columbienum* *Erigeron* spp. *Heracleum sphondylium (H. lanatum)*	Powell 1987
Populus tremuloides/ Festuca arizonica H.T.	Mountains of south-central Colorado (9,500-10,000)	Warm dry	*P. tremuloides* climax	Usuelly pure stands	*F. arizonica* *F. thurberi* *M. montana* *L. argenteus*	Komarkova et al. 1988
Populus tremuloides/ Festuca thurberi H.T.,C.T.(CO); C.T.(UT) [*P. tremuloides/F. thurberi-Carex geyeri* H.T.(CO)]	Mounteins of Uteh (8,000-10,000) and Colorado (9,000-10,500)	Werm dry	*P. tremuloides* climax or stable (CO). Stable or seral to unknown ultimate climax (UT). Probably *A. lasiocarpa* *P. engelmannii*	Usuelly pure stands. May contain *A. lasiocarpa* *P. engelmannii* *P. menziesii* *P. contorta* *P. flexilis*	*F. thurberi* *S. oreophilus* *B. carinatus* *S. occidentalis* *C. geyeri* *L. leucenthus* *T. officinale* *T. fendleri*	Hess and Alexander 1986 Hess and Wasser 1982 Johnston and Hendzel 1985 Komarkova et al. 1988 Mueggler 1987 Powell 1987
Populus tremuloides-Abies concolor/ Poa pratensis C.T.	Mounteins of southern Uteh and eastern Nevada (8,000-8,800)	Warm dry to well-drained	*P. tremuloides* seral to *A. concolor*	*A. concolor* *P. menziesii*	*P. pratensis* *J. communis* *A. trachycaulum* *B. carinatus* *S. occidentelis* *T. officinale* *T. fendleri*	Mueggler 1987
Populus tremuloides/ Poa pratensis C.T.	Mountains of southeastern Idaho, southern Uteh, and eastern Nevada (7,000-9,000); Front Range, central Colorado (8,500-9,600)	Cool moist to well-drained	*P. tremuloides* stable or seral to unknown ultimate climax (ID,NE,UT). May be grazing disclimax. Seral (CO) to *A. lesiocarpe* *A. concolor* *P. pungens* *P. menziesii*	*A. lasiocarpa* *A. concolor* *P. pungens* *P. menziesii* *P. engelmannii* *P. ponderose* *P. flexilis*	*P. pratensis* *P. monogynus* *B. carinatus* *C. rubescens* *P. nervosa* *A. millefolium* *S. stellata* *T. officinale* *T. fendleri* *Trifolium longipes* *V. americane*	Mueggler 1987 Powell 1987
Populus tremuloides/ Stipa comata C.T.	Mountains of southeestern Idaho south to the plateaus of southern Utah (6,500-9,500)	Warm dry	*P. tremuloides* stable or seral to unknown ultimate climax. Probably *P. ponderosa*	Usually pure stands. May contain *P. ponderosa*	*S. comata* *F. idahoensis* *P. fendleriana* *S. hystrix* *A. microphylla* *L. argenteus* *T. officinale*	Mueggler 1987
Populus tremuloides/ Carex foenea C.T.	Front Range, central Colorado (9,300-10,700)	Cool moist	*P. tremuloides* seral to *A. concolor* *P. menziesii* (low elevations) *A. lasiocarpa* *P. engelmannii* (high elevations)	*A. concolor* *P. menziesii* *A. lasiocarpa* *P. engelmannii* *P. contorta* *P. flexilis*	*C. foenea* *B. ciliatus* *R. woodsii* *A. millefolium* *A. miser* *F. ovalis (F. virginiana)* *Thermopsis divaricarpa*	Powell 1987
Populus tremuloides-Abies lasiocarpa/ Carex geyeri C.T.	Mountains of southeastern Idaho, Uteh, and western Wyoming (6,000-10,000)	Cool dry	*P. tremuloides* seral to *A. lasiocarpe* *P. engelmennii*	*A. lasiocarpa* *P. engelmannii* *P. menziesii*	*C. geyeri* *S. oreophilus* *C. rubescens* *S. occidentelis* *C. rossii* *A. millefolium* *A. miser* *F. vesca (F. americena)* *O. chilensis* *T. fendleri* *T. longipes*	Mueggler 1987
Populus tremuloides-Pinus contorta/ Carex geyeri C.T.	Mountains of southeastern Idaho and northeastern Utah (8,200-9,400)	Cool dry	*P. tremuloides* seral to unknown ultimate climax. Probably *A. lasiocarpa* *P. menziesii*	*A. lasiocarpa* *P. menziesii* *P. contorta*	*C. geyeri* *V. scoparium* *C. rubescens* *L. argenteus* *O. chilensis* *T. fendleri*	Mueggler 1987
Populus tremuloides/ Carex geyeri H.T.	Mountains of Utah, south-eastern Wyoming, and north-central and west-central Colorado (7,500-10,000)	Cool dry to well-drained	*P. tremuloides* climax (CO,WY). Seral to unknown ultimate climex (UT)	Usuelly pure stands. May contain (CO) *A. lasiocarpe* *P. contorta* *P. flexilis*	*G. geyeri* *B. repens* *J. communis* *S. oreophilus* *C. rossii* *C. rubescens* *A. cordifolia* *L. leucanthus* *Ligusticum* spp. *O. depauperata*	Alexander et al. 1986 Hess end Alexander 1986 Hoffman and Alexander 1983 Johnston end Hendzel 1985 Mauk and Henderson 1984
Populus tremuloides-Abies lasiocarpa/ Carex rossii C.T.	Mountains of southern Utah and eastern Nevada (8,000-10,300)	Cool dry	*P. tremuloides* seral to *A. lesiocarpa* *P. engelmennii*	*A. lasiocarpa* *P. engelmannii*	*C. rossii* *Bromus anomalus* *A. miser* *L. argenteus* *T. officinale* *Trifolium* spp.	Mueggler 1987
Populus tremuloides/ Carex rossii C.T.	Mountains of southern Utah and eastern Nevada (8,000-10,500)	Cool dry	*P. tremuloides* stable or serel to unknown ultimate climex. Probebly *A. lasiocarpa* *P. engelmannii*	*A. lasiocerpa* *P. engelmannii* *P. flexilis*	*C. rossii* *A. tridentata* *S. oreophilus* *A. trachyceulum* *B. anomalus* *P. fendleriane* *S. occidentalis* *T. officinale*	Mueggler 1987
Populus tremuloides/ Astragalus miser C.T.	Mountains of western Wyoming and Utah (7,500-10,000), and south-central Colorado (10,000-10,600)	Cool to well-drained	*P. tremuloides* stable or seral to unknown ultimate climex. May be grazing disclimex (UT).	*P. flexilis*	*A. miser* *C. geyeri* *A. millefolium* *G. viscosissimum* *L. ergenteus* *T. fendleri*	Mueggler 1987 Powell 1987

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
Populus tremuloides/ Heracleum sphondylium H.T., C.T. [*P. tremuloides/ Heracleum lanatum* H.T.]	Mountains of south-central and western Colorado (8,500-9,900)	Warm moist to wet	*P. tremuloides* climax or stable	Usually pure stands. May contain *P. balsamifera*	*H. sphondylium (H. lanatum)* *A. tenuifolia* *B. ciliatus* *E. glaucus* *Pedicularis bracteosa* *T. fendleri*	Hess and Wasser 1982 Hoffman 1988 Hoffman and Alexander 1980, 1983 Powell 1987
Populus tremuloides/ Lathyrus leucanthus C.T.	Front Range, central Colorado (10,000-10,500)	Cool moist to well-drained	*P. tremuloides* stable or seral to unknown ultimate climax. May be grazing disclimax.	Usually pure stands	*L. leucanthus* *R. woodsii* *B. porteri* *F. thurberi* *A. millefolium*	Powell 1987
Populus tremuloides/ Ligularia bigelovii C.T. [*P. tremuloides Senecio bigelovii* C.T.]	Front Range, central Colorado (8,500-9,000)	Cool moist	*P. tremuloides* seral to unknown ultimate climax. Probably *P. menziesii* *P. pungens* *A. concolor*	*P. menziesii* *P. pungens* *A. concolor* *P. contorta*	*L. bigelovii* *J. communis* *R. woodsii* *F. ovalis (F. virginiana)* *G. boreale* *G. richardsonii*	Powell 1987
Populus tremuloides/ Ligusticum porteri H.T.;C.T.	Front Range, central Colorado, and mountains of southwestern Colorado (9,000-10,000)	Warm moist to well-drained	*P. tremuloides* climax or seral to unknown ultimate climax. Probably *A. concolor* *P. pungens* *P. menziesii*	Usually pure stands. May contain *A. concolor* *P. pungens* *P. menziesii* *P. flexilis*	*L. porteri* *S. oreophilus* *C. geyeri* *L. leucanthus* *T. fendleri* *V. americana*	Johnston and Hendzel 1985 Powell 1987
Populus tremuloides/ Lupinus argenteus H.T.	Bighorn Mountains, north-central Wyoming (7,000-7,800)	Warm well-drained	*P. tremuloides* climax	Usually pure stands	*Lupinus* spp. *Carex* spp. *Trifolium* spp.	Hoffman and Alexander 1976
Populus tremuloides/ Pteridium aquilinum H.T.,C.T. (CO);C.T.(UT)	Front Range, central Colorado; mountains of western and south-central Colorado (8,000-9,000), and northern Utah (5,800-9,400)	Warm poorly-drained	*P. tremuloides* climax or stable (CO). Stable or seral to unknown ultimate climax (UT)	Usually pure stands. May contain *P. menziesii* (FR CO)	*P. equilinum* *B. carinatus* *E. glaucus* *C. geyeri* *Melica subulata* *R. occidentalis* *S. scrra* *T. fendleri*	Hoffman 1988 Hoffman and Alexander 1980, 1983 Komarkova et al. 1988 Mueggler 1987 Powell 1987
Populus tremuloides-Abies lasiocarpa/ Thalictrum fendleri C.T.	Mountains of southeastern Idaho, western Wyoming, Utah, and eastern Nevada (7,000-10,100)	Cool moist	*P. tremuloides* seral to *A. lasiocarpa* *P. engelmannii*	*A. lasiocarpa* *P. engelmannii*	*T. fendleri* *P. myrsinites* *S. oreophilus* *B. carinatus* *C. rossii* *G. viscosissimum* *O. chilensis*	Mueggler 1987
Populus tremuloides-Pinus contorta/ Thalictrum fendleri C.T.	Mountains of northern Utah (7,100-8,900)	Warm moist to well-drained	*P. tremuloides* seral to unknown ultimate climax. Probably *A. lasiocarpa*	*A. lasiocarpa* *P. contorta*	*T. fendleri* *S. oreophilus* *A. trachycaulum* *E. glaucus* *G. viscosissimum* *O. chilensis*	Mueggler 1987
Populus tremuloides/ Thalictrum fendleri H.T. (CO, SE WY); C.T.(CO, W WY,ID, NE,UT) [*P. tremuloides/T. fendleri-Carex geyeri* H.T.(CO)] *T. fendleri* (lypic) phase *Delphinium barbeyi* phase (CO) *Ligusticum porteri* phese (CO)	Mountains of southeastern Idaho, Utah, eastern Nevada, western and southeastern Wyoming, and Colorado (8,000-10,500)	Cool moist	*P. tremuloides* climax (SE WY, CO). Stable or seral to unknown ultimate climax (FR CO, ID, NE, UT). Probably *A. lasiocarpe* *P. menziesii*	Usually pure stands. May contain *A. lasiocarpa* *P. menziesii* *P. flexilis* *P. contorta*	*T. fendleri* *S. oreophilus* *B. ciliatus* *E. glaucus* *C. geyeri* *D. barbeyi* *G. richardsonii* *L. leucanthus* *Ligusticum filicinum* *L. porteri* *L. argenteus*	Alexander et al. 1986 Hass and Alexandar 1986 Hess and Wassar 1982 Hoffman 1988 Hoffman and Alexander 1980, 1983 Komerkova et al. 1988 Johnston and Hendzel 1985 Mueggler 1987 Powell 1987
Populus tremuloides/ Thermopsis divaricarpe C.T.	Front Range, central Colorado (9,600-10,400)	Cool moist	*P. tremuloides* seral to *A. concolor* *P. menziesii* (low elevations) *A. lasiocarpe* *P. engelmannii* (high elevations)	*A. concolor* *P. menziesii* *A. lasiocarpe* *P. engelmannii* *P. contorta*	*T. divericarpa* *J. communis* *R. woodsii* *C. foenee* *A. millefolium* *F. ovalis (F. virginiane)*	Powell 1987
Populus tremuloides/ Veratrum tenuipetalum H.T.(CO) [*P. tremuloides/ V. californicum* C.T.(NE,UT)]	Mountains of northwestern Colorado, northern Utah, and eastern Nevada (7,000-8,000)	Cool moist	*P. tremuloides* climax (CO). Stable or seral to unknown ultimate climax (NE,UT)	Usually pure stands	*V. californicum* *V. tenuipetalum* *B. ciliatus* *Poa alpinum* *Carex hoodii* *L. porteri* *M. arizonica* *Mertensia ciliata* *S. jamesiana*	Hoffman and Alexander 1980 Mueggler 1987
Populus tremuloides-Abies lasiocarpa/ Tall forb C.T.	Mountains of southeastern Idaho, western Wyoming, Utah, and eastern Nevada (6,800-10,200)	Warm well-drained	*P. tremuloides* seral to *A. lasiocarpa* *P. engelmannii*	*A. lasiocarpa* *P. engelmannii*	*B. carinatus* *E. glaucus* *A. engelmannii* *Delphinium occidentalis* *Osmorhiza* spp. *R. occidentalis* *Valeriana occidentalis*	Mueggler 1987
Populus tremuloides/ Tall forb C.T.	Mountains of western Wyoming, Utah, and eastern Nevada (7,000-9,000)	Warm moist to well-drained	*P. tremuloides* stable or seral to *A. lasiocarpa*	*A. lasiocarpa*	*Agastache urticifolia* *A. engelmannii* *D. occidentalis* *Hackelia floribunda* *H. sphondylium (H. lanatum)* *M. arizonica*	Mueggler 1987
Populus tremuloides-Pinus ponderosa C.T.	Mountains of Utah (8,000-8,900)	Warm dry	*P. tremuloides* seral to *P. ponderosa*	*P. ponderosa*	*B. repens* *J. communis* *Q. gambelii* *S. oreophilus* *P. fendleriana* *A. millefolium* *T. officinale*	Mueggler 1987
Populus tremuloides-Pinus flexilis C.T.	Mountains of western Wyoming, Utah, and eastern Nevada (≥9,000)	Cool dry	*P. tremuloides* usually stable. May be succeeded by *P. flexilis*	*P. flexilis*	*B. repens* *S. oreophilus* *A. trachycaulum* *C. rossii* *A. millefolium* *S. jamesiana*	Mueggler 1987

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
Populus tremuloides-Picea pungens C.T.	Mountains of Utah (7,400-9,100)	Cool dry	*P. tremuloides* seral to *P. pungens*	*P. pungens*	*J. communis* *S. oreophilus* *B. enomalus* *P. pretensis* *A. millefolium* *T. officinale*	Mueggler 1987
Pinus contorta series and other P. contorta-domineted vegetation						
Pinus contorta/Arctostaphylos uva-ursi H.T.	Mountains of northern Utah and north-central Wyoming; Front Range, Colorado (7,800-9,500)	Warm dry to well-dreined	*P. contorta* climex or stable	Usuelly pure stends. May contein *P. tremuloides*	*A. uva-ursi* *B. repens* *J. communis* *S. betulifolie* *S. hystrix* *C. rossii*	Hoffman and Alexander 1976 Meuk and Henderson 1984 Radloff 1983
Pinus contorta/Berberis repens C.T.	Mountains of northern Utah (7,700-10,000)	Cool dry to well-drained	*P. contorta* seral to unknown ultimate climax. Probebly *A. lasiocerpa* *A. concolor*	Usually *P. tremuloides*. Mey elso contain *A. lasiocerpe* *A. concolor*	*B. repens* *A. petula* *J. communis* *P. myrsinites* *C. geyeri* *A. cordifolia* *L. ergenteus*	Mauk and Henderson 1984
Pinus contorta/Juniperus communis H.T.(CO, SE WY);C.T.(ID,NW WY, UT)	Mountains of southeastern Idaho, northwestern and southeastern Wyoming, northern Utah, and central and north-central Colorado (8,000-10,500)	Cool dry	*P. contorta* climax (CO,SE WY) or seral to unknown ultimate climax (ID,NW WY). Probably *A. lasiocarpa* *P. menziesii*	Usually pure stands. Mey contain *A. lasiocarpa* *P. menziesii* *P. engelmannii* *P. ponderosa* *P. albicaulis* *P. tremuloides*	*J. communis* *A. uva-ursi* *B. repens* *S. canadensis* *A. cordifolia* *Lupinus* spp.	Alexander et al. 1986 Hess and Alexandar 1986 Komerkova et al. 1988 Mauk and Henderson 1984 Radloff 1983 Steele et al. 1983
Pinus contorta/Linneea borealis C.T.	Mountains of Montena east of Continental Divide, and northwestern Wyoming (5,600-7,200)	Cool moist to well-drained	*P. contorte* seral to unknown ultimate climax. Probably *A. lasiocarpa* *P. menziesii*	*A. lasiocarpa* *P. menziesii* *P. engelmannii*	*L. borealis* *V. globulare* *V. scoparium* *C. rubescans* *A. cordifolia* *A. latifolia*	Pfister et al. 1977 Steele et al. 1983
Pinus contorta/Purshie tridentata H.T.	Mountains of western Montana (≤6,600)	Warm dry to well-drained	*P. contorte* climax or steble	Usually pure stands. Mey contein *A. lasiocarpa* *P. menziesii* *P. engelmannii* *P. tremuloides*	*P. tridentata* *A. uva-ursi* *A. spicatum* *F. idahoensis* *C. rossii* *Epilobium angustifolium*	Pfister et al. 1977
Pinus contorta/Shepherdie canadensis H.T. (CO,SE WY);C.T.(ID,NW WY)	Mountains of southeastern Idaho (7,000-8,000), northwestern and southaastern Wyoming, and north-central Colorado (8,000-9,800)	Warm dry to well-drained	*P. contorte* climax (CO,SE WY) or seral to unknown ultimate climax (ID,NW WY). Probably *A. lasiocarpa* *P. menziesii*	Usually pure stands. May contain *A. lasiocarpe* *P. menziesii* *P. engelmennii* *P. tremuloides*	*S. canedensis* *A. uve-ursi* *J. communis* *L. borealis* *P. myrsinites* *R. woodsii* *V. scoparium* *A. cordifolia*	Alexander et al. 1986 Hess and Alexander 1986 Hess and Wasser 1982 Hoffman and Alexander 1980 Steele et al. 1983
Pinus contorta/Spiraea betulifolia C.T.	Mountains of southeastern Idaho and northwestern Wyoming (7,000-8,000)	Warm dry	*P. contorta* seral to unknown ultimate climax. Probably *A. lasiocarpa*	*A. lasiocarpa* *P. engelmannii* *P. menziesii*	*S. betulifolia* *P. myrsinites* *S. oreophilus* *C. rubescens* *C. geyeri*	Steele et al. 1983
Pinus contorta/Vaccinium ceespitosum C.T.	Mountains of south-central Montana, Idaho (5,000-7,500), and northern Utah (8,300-10,000)	Cool moist to well-drained	*P. contorta* seral to unknown ultimate climax. Probably *A. lasiocarpa* *P. menziesii*	*A. lasiocarpe* *P. menziesii* *P. engelmennii*	*V. caespitosum* *J. communis* *L. borealis* *V. scoparium* *C. rubescens* *Festuca ovina*	Cooper et al. 1987 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981
Pinus contorta/Vaccinium globulare C.T.	Mountains of southeastern Idaho, northwestern Wyoming, and northern Utah (7,500-9,000)	Cool well-drained	*P. contorta* seral to unknown ultimate climax. Probably *A. lasiocarpa* *P. menziesii*	*A. lasiocarpa* *P. menziesii* *P. engelmannii*	*V. globulare* *L. utahensis* *V. scoparium* *C. rubescens*	Steele et al. 1983
Pinus contorte/Vaccinium myrtillus H.T.	Front Range, Colorado (8,500-10,000)	Cool dry	*P. contorta* climax	*P. tremuloides*	*V. myrtillus* *L. borealis* *P. myrsinites* *C. geyeri*	Radloff 1983
Pinus contorta/Vaccinium scoperium H.T. (CO,SE WY);C.T.(ID,UT,NW WY)	Mountains of Montana, Idaho, northwestern Wyoming (7,000-8,500), northern Utah, southeastern Wyoming, and western and central Colorado (8,500-10,500)	Cool dry	*P. contorta* climex (CO,SE WY) or seral to unknown ultimate climax (ID,NW WY. UT). Probably *A. lasiocarpa* *A. grandis* *P. menziesii*	Usually pure stands. May contain *A. lasiocarpa* *P. menziesii* *A. grandis* *P. engelmennii* *P. flexilis* *P. albicaulis* *L. occidentalis* *T. heterophylle*	*V. scoparium* *A. uva-ursi* *B. repens* *L. borealis* *J. communis* *C. rubescens* *C. geyeri* *C. rossii* *A. cordifolia* *L. ergenteus*	Alexander et al. 1986 Cooper et el. 1987 Hess and Alexander 1986 Hoffman and Alexander 1980 Komarkova et al. 1988 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981, 1983
Pinus contorta/Calemagrostis canadensis C.T.	Mountains of northern Utah (8,800-9,800)	Cool moist	*P. contorta* seral to unknown ultimate climax. Probably *A. lasiocarpa*	*A. lasiocarpa* *P. engelmennii* *P. tremuloides*	*C. canadensis* *J. communis* *P. nervose* *A. cordifolia*	Mauk and Henderson 1984
Pinus contorte/Calemegrostis rubescens C.T.	Mountains of Montana, Idaho, northeastern Utah, and northwestern Wyoming (6,000-8,000)	Cool dry	*P. contorta* seral to unknown ultimate climax. Probably *A. lasiocarpe* *P. menziesii*	Usually pure stands. May contain *A. lasiocarpa* *P. menziesii* *P. engelmannii* *L. occidentalis*	*C. rubescens* *A. uva-ursi* *S. albus* *V. scoparium* *C. geyeri* *A. cordifolie*	Pfister et al. 1977 Steele et al. 1983
Pinus contorta/Festuca idahoensis H.T.	Mountains of central Ideho (5,000-9,000)	Warm dry to well-drained	*P. contorta* climax. *P. albicaulis* minor climex	*P. albicaulis* *P. menziesii*	*F. idahoensis* *C. rossii* *Artemisia* spp. *Penstemon* spp.	Steele et al. 1981
Pinus contorte/Carex geyeri H.T.(CO,SE WY); C.T.(ID,NW WY)	Mountains of central Idaho, northwestern Wyoming (6,000-9,000), soulh-eastern Wyoming, and north-central Colorado (7,500-10,000)	Cool dry	*P. contorta* climex (CO) or serel to unknown ultimate climax (ID,WY). Probably *A. lasiocarpe* *P. menziesii*	Usually pure stends. May contain *A. lasiocarpe* *P. menziesii* *P. engelmannii* *P. albicaulis* *P. flexilis* *P. tremuloides*	*C. geyeri* *B. repens* *J. communis* *P. myrsinites* *R. woodsii* *S. oreophilus* *A. cordifolie* *Fragaria* spp. *L. argenteus*	Alexander et el. 1986 Hess and Alexander 1986 Hess and Wesser 1982 Komerkova et al. 1988 Steele et al. 1981, 1983

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
Pinus contorta *Carex rossii* H.T.(UT,SE WY); C.T.(NW WY)	Mountains of northern Utah, and northwestern and southeastern Wyoming (8,500-10,000)	Cool dry	*P. contorta* climax (SE WY,UT) or seral to unknown ultimate climax (NW WY). Probably *A. lasiocarpa* *P. engelmannii*	May be pure stands. Usually contain *A. lasiocarpa* *P. engelmannii* *P. albicaulis* *P. tremuloides*	*C. rossii* *P. nervosa* *L. argenteus* *Pyrola* spp. *Sedum lanceolatum* *Solidago multiradiata*	Alexander et al. 1986 Mauk and Henderson 1984 Steele et al. 1983
Pinus contorta *Arnica cordifolia* C.T.	Mountains of southeastern Idaho and northwestern Wyoming (6,000-9,000)	Cool dry	*P. contorta* seral to unknown ultimate climax. Probably *A. lasiocarpa* *P. engelmannii* *P. menziesii*	Usually pure stands. May contain *A. lasiocarpa* *P. engelmannii* *P. menziesii* *P. albicaulis* *P. flexilis*	*A. cordifolia* *A. racemosa* *A. miser* *P. secunda*	Steele et al. 1983
Pinus contorta *Xerophyllum tenax* C.T.	Mountains of northern Idaho (6,000-8,000)	Cool dry	*P. contorta* seral to *A. lasiocarpa*	*A. lasiocarpa* *P. engelmannii* *P. menziesii*	*X. tenax* *V. globulare* *V. scoparium*	Cooper et al. 1987
Pinus aristata series						
Pinus aristata *Juniperus communis* H.T.	Mountains of south-central Colorado (9,500-10,000)	Cool dry	*P. aristata* climax or co-climax with *P. menziesii*	*P. menziesii* *P. flexilis* *P. tremuloides*	*J. communis* *A. uva-ursi* *Artemisia* spp. *M. montana* *P. fendleriana*	Komarkova et al. 1988
Pinus aristata *Ribes montigenum* H.T. (Scree forest)	Mountains of northern New Mexico and southern Colorado (11,000-11,500)	Cool dry	*P. aristata* climax	Usually pure stands. May contain *P. engelmannii*	*R. montigenum* *S. bronchialis*	DeVelice et al. 1986
Pinus aristata *Festuca arizonica* H.T.	Mountains of northern New Mexico, and southern and western Colorado (8,600-10,000)	Warm dry	*P. aristata* climax or co-climax with *P. menziesii*	*P. menziesii* *P. flexilis* *P. tremuloides*	*F. arizonica* *R. cereum* *K. cristata* (*K. macrantha*) *M. montana* *A. frigida*	DeVelice et al. 1986 Komarkova et al. 1988
Pinus aristata *Festuca thurberi* H.T.	Mountains of northern New Mexico and southern and western Colorado (10,000-11,800)	Cool dry	*P. aristata* climax or co-climax with *P. engelmannii*	*P. engelmannii* *P. tremuloides*	*F. thurberi* *R. montigenum* *A. cordifolia* *Polemonium pulcherrimum* (*P. delicatum*) *S. bronchialis*	DeVelice et al. 1986 Komarkova et al. 1988
Pinus aristata *Trifolium dasyphyllum* H.T.	Mountains of north-central Colorado (11,400-11,600)	Cool dry	*P. aristata* climax. *P. engelmannii* minor climax	*P. engelmannii*	*T. dasyphyllum* *C. foenea* *A. lanulosa* *Penstemon whippleanus* *P. pulcherrimum* (*P. delicatum*)	Hess and Alexander 1986
Picea glauca series						
Picea glauca *Linnaea borealis* H.T.	Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (5,800-6,500)	Cool well-drained	*P. glauca* climax	*P. ponderosa* *P. tremuloides* *B. papyrifera*	*L. borealis* *J. communis* *Rosa acicularis* *O. asperifolia* *F. ovalis* (*F. virginiana*)	Hoffman and Alexander 1987
Picea glauca *Vaccinium scoparium* H.T.	Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (5,700-6,700)	Cool well-drained	*P. glauca* climax	*P. ponderosa* *P. tremuloides* *B. papyrifera*	*V. scoparium* *B. repens* *J. communis* *S. betulifolia* *F. ovalis* (*F. virginiana*) *G. boreale*	Hoffman and Alexander 1987
Picea engelmannii series						
Picea engelmannii *Acer glabrum* H.T.	Mountains of south-central Arizona and southern New Mexico (8,500-9,500)	Cool moist	*P. engelmannii* climax. *A. lasiocarpa* *P. engelmannii* minor climaxes	*A. lasiocarpa* *P. engelmannii* *P. menziesii* *A. concolor* *P. strobiformis* *P. tremuloides*	*A. glabrum* *B. ciliatus* *L. porteri* *S. stellata* *V. canadensis*	Alexander et al. 1984a DeVelice and Ludwig 1983 Moir and Ludwig 1979
Picea engelmannii *Juniperus communis* H.T.	Mountains of northwestern Wyoming (7,400-10,300)	Cool dry	*P. engelmannii* climax	*P. menziesii* *P. contorta* *P. flexilis* *P. albicaulis*	*J. communis* *A. cordifolia* *Frasera speciosa* *S. multiradiata*	Steele et al. 1983
Picea engelmannii *Linnaea borealis* H.T.	Mountains of Montana east of Continental Divide (4,200-7,800), and northwestern Wyoming (8,200-8,200)	Cool well-drained	*P. engelmannii* climax	*P. menziesii* *P. contorta*	*L. borealis* *J. communis* *S. albus* *V. globulare* *C. rubescens* *A. cordifolia* *P. secunda*	Pfister et al. 1977 Steele et al. 1983
Picea engelmannii *Physocarpus malvaceus* H.T.	Mountains of south-central Montana, southeastern Idaho, and northwestern Wyoming (5,900-7,200)	Cool moist	*P. engelmannii* climax. *A. lasiocarpa* minor climax	*A. lasiocarpa* *P. menziesii* *P. contorta*	*P. malvaceus* *S. betulifolia* *S. albus* *G. triflorum* *Thalictrum* spp.	Pfister et al. 1977 Steele et al. 1983
Picea engelmannii *Ribes montigenum* H.T.	Mountains of northwestern Wyoming (8,400-9,700) and southern Utah (10,000-11,400)	Cool dry	*P. engelmannii* climax	*P. contorta* *P. albicaulis* *P. flexilis* *P. tremuloides*	*R. montigenum* *F. ovina* *A. caerulea* *A. latifolia* *A. miser* *Sibbaldia procumbens*	Pfister 1972 Steele et al. 1983 Youngblood and Mauk 1985
Picea engelmannii *Salix pseudolapponum* H.T. [*P. engelmannii* *Abies lasiocarpa* *S. pseudolapponum* H.T.]	Mountains of northern and central Colorado (11,200-11,800)	Cool moist	*P. engelmannii* climax	*A. lasiocarpa* *P. contorta* *P. flexilis*	*S. pseudolapponum* *V. scoparium* *G. rossii* *P. pulcherrimum* (*P. delicatum*)	Hess and Alexander 1986 Hess and Wesser 1982
Picea engelmannii *Vaccinium caespitosum* H.T.	Mountains of northwestern Montana (3,100-5,300) and northern Utah (9,300-11,000)	Cool moist to well-drained	*P. engelmannii* climax	*P. menziesii* *P. contorta* *P. ponderosa* *L. occidentalis* *P. tremuloides*	*V. caespitosum* *L. borealis* *R. montigenum* *V. scoparium* *C. rubescens*	Mauk and Henderson 1984 Pfister et al. 1977
Picea engelmannii *Vaccinium myrtillus* H.T. [*P. engelmannii*/*V. myrtillus*- *Polemonium pulcherrimum* H.T.] [*P. engelmannii* *Vaccinium scoparium*- *P. delicatum* H.T.] *P. engelmannii* phase *Abies lasiocarpa* phase	Mountains of northern and southwestern New Mexico, and southern and central Colorado (9,400-11,900)	Cool dry to well-drained	*P. engelmannii* climax. *A. lasiocarpa* co-climax, minor climax or absent	*A. lasiocarpa* *P. menziesii* *P. strobiformis* *P. pungens* *P. aristata* *P. tremuloides*	*V. myrtillus* *J. americana* *J. communis* *Rosa* spp. *V. scoparium* *P. pulcherrimum* (*P. delicatum*) *Senecio amplectens*	DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979 Radloff 1983

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
Picea engelmannii *Vaccinium scoparium* H.T.	Mountains of northwestern Wyoming (8,800-10,800), north-central Wyoming (6,600-8,600), and northern Utah (9,600-11,200)	Cool dry	*P. engelmannii* climax. *A. lasiocarpa* may be minor climax	*A. lasiocarpa* *P. menziesii* *P. contorta* *P. flexilis* *P. albicaulis*	*V. scoparium* *C. rossii* *A. cordifolia* *Antennaria* spp. *F. ovalis* (*F. virginiana*) *Lupinus* spp.	Hollman and Alexander 1976 Mauk and Henderson 1984 Steele et al. 1983
Picea engelmannii *Elymus triticoides* H.T.	Mountains of southern New Mexico (9,000-9,900)	Cool dry to well-drained	*P. engelmannii* climax or co-climax with *A. lasiocarpa*. *P. menziesii* minor climax	*A. lasiocarpa* *P. menziesii* *P. aristata* *P. tremuloides*	*E. triticoides* *A. glabrum* *H. dumosis* *J. americana* *Ribes* spp.	Alexander et al. 1984a Moir and Ludwig 1979
Picea engelmannii *Carex disperma* H.T.	Mountains of central and southern Idaho, and northwestern Wyoming (6,000-8,000)	Cool moist	*P. engelmannii* climax. *A. lasiocarpa* minor climax	*A. lasiocarpa* *P. pungens* *P. contorta*	*C. disperma* *Actaa rubra* *G. trillorum* *G. richardsonii* *Saxifraga arguta* *S. triangularis*	Steele et al. 1981, 1983
Picea engelmannii *Carex foanea* H.T.	Mountains of south-central Arizona (10,000-10,500)	Cool to well-drained	*P. engelmannii* climax. *A. lasiocarpa* minor climax	*A. lasiocarpa* *P. menziesii* *P. tremuloides*	*C. foanae* *B. ciliatus* *P. pratensis*	DeVelice and Ludwig 1983 Moir and Ludwig 1979
Picea engelmannii *Arnica cordifolia* H.T.	Mountains of northwestern Wyoming (7,500-10,000)	Cool dry to well-dratned	*P. engelmannii* climax	*P. menziesii* *P. contorta* *P. flexilis* *P. albicaulis* *P. tramuloides*	*A. cordifolia* *F. idahoensis* *H. kingii* *C. rossii* *A. misar* *F. speciosa* *Senecio streptanthifolius*	Steele et al. 1983
Picea engelmannii *Calthe leptosapale* H.T.	Mountains of Utah (10,000-11,000), northwestern Wyoming, and southeastern Idaho (8,200-9,500)	Cool moist	*P. engelmannii* climax. *A. lasiocarpa* minor climax	*A. lasiocarpe* *P. contorta* *P. albicaulis*	*C. leptosepale* *Deschampsia caespitosa* *Arnica* spp. *Pedicularis* spp. *Phleum alpinum* *Trollis laxus* *S. triangularis*	Mauk and Henderson 1984 Steele et al. 1983
Picee engelmannii *Clintonia uniflora* H.T. *C. uniflora* (typic) phase *Vaccinium caespitosum* phase	Mountains of northwestern Montana (3,000-4,000)	Warm moist to well-drained	*P. engelmannii* climax	*P. menziesii* *P. ponderosa* *P. contorta* *L. occidentalis*	*C. uniflora* *Cornus canadensis* *V. caespitosum* *A. nudicaulis*	Pfister et al. 1977
Picea engelmennii *Equisetum arvense* H.T.	Mountains of Montana, central Idaho (2,900-6,800), northwestern Wyoming, and northern Utah (6,000-9,000)	Warm to cool wet	*P. engelmannii* climax. *A. lasiocarpa* minor climax	*A. lasiocarpe* *P. pungens* *P. contorte*	*E. arvanse* *C. canadensis* *Luzula perviflora* *Equisetum scirpoides* *S. triangularis* *S. amplexifolius*	Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981, 1983
Picea engelmannii *Erigeron eximius* H.T. · *Picea engelmannii* *Festuca thurberi* H.T. (*P. pungens-P. engelmennii* *E. superbus* H.T.)	Mountains of eastern Arizona and southwestern New Mexico (8,500-9,500)	Cool well-drained	*P. engelmannii* climax or co-climax with *P. menziesii* *P. pungens*. *A. concolor* minor climax	*E. eximius* (*E. superbus*) *A. lasiocarpa* *A. concolor* *P. ponderosa* *P. strobiformis* *P. tremuloides*	*B. ciliatus* *G. richardsonii* *L. arizonicus* *S. stellata* *V. canadensis*	Filzhugh et al. 1987 Moir and Ludwig 1979
Picea engelmannii *Gallum triflorum* H.T.	Mountains of south-central Montana, central Idaho, and northwestern Wyoming (6,000-8,500)	Cool moist	*P. engelmannii* climax. *A. lasiocarpa* minor climax	*A. lasiocarpa* *P. menziesii* *P. pungens* *P. ponderosa* *P. contorta*	*G. triflorum* *C. canadensis* *A. rubra* *S. triangularis* *S. stellata* *S. amplexifolius*	Pfister et al. 1977 Steele et al. 1981, 1983
Picea engelmannii *Geum rossii* H.T.	Mountains of north-central Arizona (11,200-11,800)	Cool dry	*P. engelmannii* climax	*P. tremuloides*	*G. rossii* *Festuca brachyphylla* *P. pulcherrimum* (*P. dalicatum*)	Moir and Ludwig 1979
Picea engelmannii *Heracleum sphondylium* H.T. (Riparian forest)	Mountains of northern New Mexico and southern Colorado (8,800-9,200)	Cool moist	*P. engelmannii* climax	*A. lasiocarpe* *P. tremuloides*	*H. sphondylium* (*H. lenatum*) *Lonicera involucrata* *B. cillete* *E. eximius* *G. richardsonii* *M. ciliata* *V. canadensis*	DeVellce at al. 1986
Picea engelmannii *Hypnum revolutum* H.T.	Mountains of central and southeastern Idaho (7,100-8,300), and northwestern Wyoming (7,700-10,500)	Cool moist to well-drained	*P. engelmannii* climax or co-climax with *P. menziesii* (ID)	*P. menziesii* *P. flexilis* *P. albicaulis*	*H. revolutum* *Cladonia fimbriata* *Discranowiesia crispula* *Peltigara rafescens* *S. amplexifolius* *S. triangularis*	Steele at al. 1981, 1983
Picea engelmannii *Saxifraga bronchialis* H.T. (Scree forest)	Mountains of northern New Mexico and southern Colorado (11,200-11,800)	Cool dry	*P. engelmannii* climax. *A. lasiocarpa* minor climax	*A. lasiocarpa* *P. tramuloidas*	*S. bronchialis* *J. communis* *C. rossii*	DeVellce et al. 1986
Picea engelmannii *Senecio cardamine* H.T. (*P. pungens-P engelmannii* *S. cardamina* H.T.) *Abias concolor* phase *Abies lasiocarpa* phase	Mountains of eastern Arizona and southwestern New Mexico (8,500-9,400)	Cool moist	*P. engelmannii* climax or co-climax with *A. lasiocarpa* *A. concolor* *P. menziesii*	*A. lasiocarpa* *A. concolor* *P. menziesii* *P. pungons* *P. ponderosa* *P. strobiformis*	*S. cardamine* *B. ciliatus* *G. richardsonii* *F. ovalis* (*F. virginiana*) *P. aquilinum*	Fitzhugh et al. 1987 Moir and Ludwig 1979
Picea engelmannii *Sanecio streptanthifolius* H.T. *P. angelmannii* phase *Pseudotsuga manziesii* phase	Mountains of central and southwestern Montana (8,900-8,800)	Coot dry to well-drained	*P. angelmannii* climax	*P. manziesii* *P. flaxilis*	*S. straptanthifolius* *J. communis* *A. cordifolia* *O. chilansis* *P. sacunda*	Pfister et al. 1977
Picea engelmannii *Smilacina stellata* H.T.	Mountains of Montana east of Continental Divide (4,400-7,400)	Warm moist	*P. engelmannii* climax	*P. manziesii* *P. contorta* *P. ponderosa*	*S. stellate* *S. oraophilus* *G. richardsonii* *S. racemosa* *T. occidentale*	Pfister at at. 1977
Picea engelmannii *Trifolium dasyphyllum* H.T.	Mountains of north-central Colorado (10,800-11,300)	Cold moist	*P. angelmannii* climax	*A. lasiocarpa* *P. aristeta*	*T. dasyphyllum* *Trisetum spicatum* *Pyrola minor* *Trifolium parryi*	Hass and Alexander 1986
Picea engelmannii Moss spp. H.T.	Mountains of southwestern New Mexico and eastern Arizona; Front Range, Colorado (9,500-11,000)	Cool dry to wati-drained	*P. engelmannii* ctimax. *A. lasiocarpa* co-climax, minor climax or absant	*A. lasiocarpa* *P. menziesii* *P. strobilormis* *P. aristata* *P. iremuloides*	Moss spp. *Rosa* spp. *Ribas* spp. *Vaccinium* spp. *L. arizonicus*	Alexander et al. 1987 Fitzhugh et al. 1987 Moir and Ludwig 1979 Radloff 1983

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
			Abies lasiocarpa series			
Abies lasiocarpa/ Acer glabrum H.T. *A. glabrum* (typic) phase *Pachistima myrsinites* phase (ID,WY)	Mountains of central and southern Idaho (5,000-8,000), northern and central Utah, northwestern Wyoming (6,000-10,000), and southwestern New Mexico (9,700-10,000)	Warm moist	*A. lasiocarpa* climax. *P. engelmannii* may be minor climax	*P. engelmannii* *P. menziesii* *P. contorta* *A. concolor* *A. grandis* *P. pungens* *P. flexilis* *P. tremuloides*	*A. glabrum* *B. repens* *P. myrsinites* *B. ciliatus* *A. cordifolia* *O. chilensis* *T. fendleri* *T. occidentale*	Alexander et al. 1987 Mauk and Henderson 1984 Steele et al. 1981, 1983 Youngblood and Mauk 1985
Abies lasiocarpa/ Alnus sinuata H.T.	Mountains of northern Montana and central Idaho (5,000-7,500)	Cool moist	*A. lasiocarpa* climax	*P. engelmannii* *P. menziesii* *P. contorta* *P. albicaulis* *L. occidentalis*	*A. sinuata* *V. globulare* *V. scoparium* *P. secunda* *X. tenax*	Pfister et al. 1977 Steele et al. 1981
Abies lasiocarpa/ Berberis repens H.T. *B. repens* (typic) phase *Picea engelmannii* phase (UT) *Pseudotsuga menziesii* phase (UT) *Pinus flexilis* phase (UT) *Juniperus communis* phase (UT) *Ribes montigenum* phase (UT) *Carex geyeri* phase (UT)	Mountains of Utah (6,000-10,800), northwestern Wyoming, and southeastern Idaho (6,600-9,000)	Warm to cool well-drained	*A. lasiocarpa* climax. *P. engelmannii* minor climax	*P. engelmannii* *P. contorta* *P. pungens* *P. menziesii* *A. concolor* *A. grandis* *P. flexilis* *P. tremuloides*	*B. repens* *J. communis* *P. myrsinites* *R. montigenum* *R. woodsii* *S. oreophilus* *C. geyeri* *C. rossii*	Mauk and Henderson 1984 Pfister 1972 Steele et al. 1983 Youngblood and Mauk 1985
Abies lasiocarpa/ Clematis pseudoalpina H.T.	Mountains of Montana east of Continental Divide (6,000-8,000)	Warm dry	*A. lasiocarpa* climax	*P. engelmannii* *P. menziesii* *P. contorta* *P. albicaulis* *P. flexilis*	*C. pseudoalpina* *C. tenuiloba* *A. cordifolia* *G. boreale* *Valeriana dioica*	Pfister et al. 1977
Abies lasiocarpa/ Holodiscus dumosus H.T. (Scree forest)	Mountains of southwestern New Mexico (9,500-10,500)	Cool dry	*A. lasiocarpa* climax or co-climax with *P. strobiformis* *P. menziesii*, *P. engelmannii* minor climax	*P. strobiformis* *P. menziesii* *P. engelmannii* *P. tremuloides*	*H. dumosus* *J. communis* *S. oreophilus* *B. ciliatus* *G. richardsonii* *H. parryi*	Fitzhugh et al. 1987
Abies lasiocarpa/ Jamesia americana H.T. (Scree forest)	Mountains of south-central Arizona (8,700-9,100)	Cool dry	*A. lasiocarpa* climax	*P. menziesii*	*J. americana* *Ribes pinetorum* *Sambucus melanocarpa* *S. oreophilus*	Muldavin et al. 1986
Abies lasiocarpa/ Juniperus communis H.T. [*A. lasiocarpa-Picea engelmannii/ J. communis* H.T.]	Mountains of central Idaho, northwestern Wyoming (7,500-9,500), Utah, northern Arizona, southwestern New Mexico, and south-central Colorado (8,500-10,500)	Warm to cold dry	*A. lasiocarpa* climax or co-climax with *P. engelmannii*	*P. engelmannii* *P. menziesii* *P. contorta* *A. concolor* *P. pungens* (UT) *P. longaeva* (UT) *P. flexilis* *P. tremuloides*	*J. communis* *A. uva-ursi* *R. woodsii* *S. canadensis* *S. oreophilus* *Poa* spp. *A. cordifolia* *P. secunda*	Komarkova et al. 1988 Mauk and Henderson 1984 Moir and Ludwig 1979 Steele et al. 1981, 1983 Youngblood and Mauk 1985
Abies lasiocarpa/ Linnaea borealis H.T. *L. borealis* (typic) phase *Vaccinium scoparium* phase *Xerophyllum tenax* phase (MT)	Mountains of Montana, central and southeastern Idaho (5,000-7,500), and northwestern Wyoming (7,000-8,500)	Cool moist to well-drained	*A. lasiocarpa* climax or co-climax with *P. engelmannii*	*P. engelmannii* *P. menziesii* *P. contorta* *P. ponderosa* *P. monticola* *L. occidentalis* *P. tremuloides*	*L. borealis* *S. canadensis* *V. scoparium* *C. rubescens* *A. cordifolia* *T. occidentalis* *X. tenax*	Pfister et al. 1977 Steele et al. 1981, 1983
Abies lasiocarpa/ Menziesia ferruginea H.T. *M. ferruginea* (typic) phase *Vaccinium scoparium* phase (ID) *Luzula hitchcockii* phase (ID) *Coptis occidentalis* phase (ID) *Xerophyllum tenax* phase (ID)	Mountains of eastern Washington, Montana, Idaho, and northwestern Wyoming (5,000-7,500)	Cool moist	*A. lasiocarpa* climax	*P. engelmannii* *P. menziesii* *P. contorta* *P. monticola* *P. albicaulis* *L. occidentalis* *T. mertensiana*	*M. ferruginea* *Ledum glandulosum* *Rhododendron albiflorum* *V. globulare* *V. scoparium* *L. hitchcockii* *C. occidentalis* *X. tenax*	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Pfister et al. 1977 Steele et al. 1981, 1983
Abies lasiocarpa/ Oplopanax horridum H.T.	Mountains of northern Montana (4,000-5,000)	Cool moist wet	*A. lasiocarpa* co-climax with *P. engelmannii*	*P. engelmannii* *P. menziesii* *P. monticola* *L. occidentalis*	*O. horridum* *T. bravifolia* *C. uniflora* *Tiarella trifoliata*	Pfister et al. 1977
Abies lasiocarpa/ Pachistima myrsinites H.T. [*A. lasiocarpa-Picea engelmannii/ P. myrsinites* H.T.(CO)]	Mountains of northern Idaho and eastern Washington (4,700-5,800), and central Colorado (9,000-9,500)	Cool to well-drained	*A. lasiocarpa* climax or co-climax with *P. engelmannii*	*P. engelmannii* *P. menziesii* *P. contorta* *P. monticola* *L. occidentalis* *P. tremuloides*	*P. myrsinites* *V. scoparium* *C. geyeri* *A. cordifolia* *C. uniflora* *Erigeron* spp. *G. triflorum*	Daubenmire and Daubenmire 1968 Hess and Wasser 1982
Abies lasiocarpa/ Physocarpus malvaceus H.T.	Mountains of southeastern Idaho, northwestern Wyoming, and northern and central Utah (6,000-9,500)	Warm moist to well-drained	*A. lasiocarpa* climax	*P. engelmannii* *P. menziesii* *A. concolor* *A. grandis* *P. tremuloides*	*P. malvaceus* *A. alnifolia* *S. betulifolia* *Sorbus scopulina* *S. albus*	Mauk and Henderson 1984 Steele et al. 1983 Youngblood and Mauk 1985
Abies lasiocarpa/ Ribes montigenum H.T. *R. montigenum* (typic) phase *Pinus albicaulis* phase (ID,WY) *Pinus contorta* phase (UT) *Trisetum spicatum* phase (UT) *Mertensia arizonica* phase (UT) *Thalictrum fendleri* phase (UT)	Mountains of southern Montana, Idaho, Utah, and northwestern Wyoming (8,000-11,000)	Cool dry	*A. lasiocarpa* climax or co-climax with *P. engelmannii*	*P. engelmannii* *P. menziesii* *P. contorta* *P. albicaulis* *P. tremuloides*	*R. montigenum* *T. spicatum* *C. rossii* *A. microphylla* *A. latifolia* *M. arizonica* *O. chilensis* *T. fendleri*	Mauk and Henderson 1984 Pfister 1972 Pfister et al. 1977 Steele et al. 1981, 1983 Youngblood and Mauk 1985
Abies lasiocarpa/ Rubus parviflorus H.T.	Mountains of northern and southwestern New Mexico, and southwestern Colorado (8,500-10,500)	Warm moist	*A. lasiocarpa* co-climax with *P. engelmannii*	*P. engelmannii* *P. menziesii* *A. concolor* *P. strobiformis* *P. tremuloides*	*R. parviflorus* *A. glabrum* *P. myrsinites* *V. myrtillus* *B. ciliatus* *E. eximius* (*E. superbus*) *G. richardsonii*	DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979
Abies lasiocarpa/ Salix glauca H.T. [*A. lasiocarpa-Picea engelmannii/ S. glauca* H.T.]	High mountains of south-central Colorado (11,000-11,800)	Cold wet	*A. lasiocarpa* co-climax with *P. engelmannii*	*P. engelmannii*	*S. glauca* *V. myrtillus* *Carex* spp. *Acomastylis rossii* *P. pulcherrimum* (*P. delicatum*)	Komarkova et al. 1988
Abies lasiocarpa/ Shepherdia canadensis H.T.	Bighorn Mountains, north-central Wyoming (8,000-8,500)	Warm dry	*A. lasiocarpa* co-climax with *P. engelmannii*	*P. engelmannii* *P. menziesii* *P. contorta*	*S. canadensis* *B. repens* *S. betulifolia* *V. scoparium* *A. cordifolia*	Hoffman and Alexander 1976

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
Abies lasiocarpa/ Spiraea betulifolia H.T.	Mountains of central and southeastern Idaho, and northwestern Wyoming (5,500-7,500)	Warm dry	*A. lasiocarpa* climax	*P. engelmannii* *P. menziesii* *P. contorta*	*S. betulifolia* *A. ainifolia* *B. repens* *P. myrsinites* *C. rubascens*	Steele et al. 1981, 1983
Abies lasiocarpa/ Symphoricarpos albus H.T.	Mountains of southeastern Idaho and northwestern Wyoming (5,700-7,600)	Warm well-drained	*A. lasiocarpa* climax	*P. engelmannii* *P. menziesii* *P. contorta* *P. tramuloides*	*S. albus* *A. alnifolia* *C. rubescens* *A. cordifolia*	Steele et al. 1983
Abies lasiocarpa/ Vaccinium caespitosum H.T. *V. caespitosum* (typic) phase *Picea engelmannii* phase (UT)	Mountains of south-central Montana, Idaho (5,000-7,500), and northern and central Utah (8,500-10,000)	Cool moist to well-drained	*A. lasiocarpa* climax. *P. engelmannii* may be minor climax	*P. engelmannii* *P. menziesii* *P. contorta* *P. albicaulis* *P. tremuloides*	*V. caespitosum* *L. borealis* *P. myrsinites* *Ribas* spp. *V. scoparium* *C. rubescens* *A. cordifolia*	Cooper et al. 1987 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981 Youngblood and Mauk 1985
Abies lasiocarpa/ Vaccinium globulare H.T. *V. globulare* (typic) phase *Pachistima myrsinites* phase (ID,WY) *Vaccinium scoparium* phase (ID,WY)	Mountains of south-central Montana and Idaho (5,000-8,700), northern Utah, and northwestern Wyoming (7,000-9,500)	Cool moist to well-drained	*A. lasiocarpa* climax	*P. engelmannii* *P. menziesii* *P. contorta* *P. albicaulis*	*V. globulare* *L. utahensis* *P. myrsinites* *R. montigenum* *S. oreophilus* *V. scoparium*	Cooper et al. 1987 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981, 1983 Youngblood and Mauk 1985
Abies lasiocarpa/ Vaccinium myrtillus H.T. [*A. lasiocarpa-Picea engelmannii/V. myrtillus* H.T.] [*A. lasiocarpa/V. myrtillus-Linnaea borealis* H.T.] [*A. lasiocarpa/V. myrtillus-Rubus parviflorus* H.T.] [*A. lasiocarpa/ Vaccinium scoparium-L. borealis* H.T.] [*A. lasiocarpa/ V. scoparium* H.T.] *V. myrtillus* (typic) phase *P. engelmannii* phase (NM) *R. parviflorus* phase (AZ,NM)	Mountains of eastern and south-central Arizona, northern and southwestern New Mexico, southern and western Colorado (9,000-11,000), and central Utah (10,000-10,600)	Cool dry to well-drained	*A. lasiocarpa* climax or co-climax with *P. engelmannii*	*P. engelmannii* *P. menziesii* *A. concolor* *P. pungens* *P. contorta* (CO) *P. strobiformis* *P. flexilis* *P. aristata* *P. tremuloides*	*V. myrtillus* *L. borealis* *P. myrsinites* *Ramischia secunda* *R. montigenum* *R. parviflorus* *V. scoparium* *B. ciliatus* *E. eximius (E. superbus)* *O. chilensis* *P. racemosa*	Alexander et al. 1987 DeVelice et al. 1986 DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Hoffman 1988 Komarkova et al. 1988 Moir and Ludwig 1979 Youngblood and Mauk 1985
Abies lasiocarpa/ Vaccinium scoparium H.T. *A. lasiocarpa-Picea engelmannii/ V. scoparium* H.T. [*P. engelmannii/ V. scoparium* H.T.] *V. scoparium* (typic) phase *Pinus albicaulis* phase (ID,WY) *Calamagrostis rubescens* phase (ID,MT,WY) *Carex geyeri* phase (MT) *Arnica latifolia* phase (MT) *Thalictrum occidentale* phase (MT)	Mountains of Montana and Idaho (5,000-10,000) south to Arizona and New Mexico (8,000-11,000)	Cool dry	*A. lasiocarpa* climax or co-climax with *P. engelmannii*	*P. engelmannii* *P. menziesii* *P. contorta* *P. albicaulis* *L. occidentalis* *P. tremuloides*	*V. scoparium* *L. borealis* *P. myrsinites* *V. myrtillus* *C. rubescens* *C. geyeri* *A. cordifolia* *A. latifolia* *E. eximius (E. superbus)* *Phyllodoce empetriformis* *T. occidentale* *Valeriana sitchensis* *Viola* spp.	Alexander et al. 1986 Cooper et al. 1987 Daubenmire and Daubenmire 1968 Hess and Alexander 1986 Hess and Wasser 1982 Hoffman 1988 Hoffman and Alexander 1976, 1980, 1983 Komarkova et al. 1988 Mauk and Henderson 1984 Moir and Ludwig 1979 Pfister 1972 Pfister et al. 1977 Steele et al. 1981, 1983
Abies lasiocarpa-Pinus albicaulis/ Vaccinium scoparium H.T.	Mountains of Montana east of Continental Divide (7,000-9,000)	Cool dry	*A. lasiocarpa* co-climax with *P. albicaulis*	*P. albicaulis* *P. engelmannii* *P. contorta*	*V. scoparium* *C. rossii* *A. latifolia* *X. tenax* *Hieracium gracile*	Pfister et al. 1977
Abies lasiocarpa/ Calamagrostis canadensis H.T. *A. lasiocarpa-Picea engelmannii/ C. canadensis* H.T. [*P. engelmannii/ C. canadensis* H.T.] *C. canadensis* (typic) phase *Vaccinium caespitosum* phase (ID,MT) *Galium triflorum* phase (MT) *Ledum glandulosum* phase (ID) *Ligusticum canbyi* phase (ID)	Mountains of central Montana, Idaho, northwestern Wyoming (5,000-9,000), northern Utah, and northern and central Colorado (8,000-10,500)	Cool wet	*A. lasiocarpa* climax or co-climax with *P. engelmannii*	*P. engelmannii* *P. menziesii* (ID) *P. contorta* *P. pungens* (UT) *P. albicaulis* *P. tremuloides*	*C. canadensis* *L. glandulosum* *Vaccinium* spp. *Carex* spp. *E. arvense* *G. triflorum* *L. canbyi* *S. arguta* *S. triangularis*	Cooper et al. 1987 Hess and Alexander 1986 Komarkova et al. 1988 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981, 1983
Abies lasiocarpa/ Calamagrostis rubescens H.T. *C. rubescens* (typic) phase *Pachistima myrsinites* phase (ID,WY)	Mountains of Montana east of Continental Divide, Idaho, northern Utah, and northwestern Wyoming (6,000-9,000)	Cool dry	*A. lasiocarpa* climax	*P. engelmannii* *P. menziesii* *P. contorta* *P. albicaulis* *P. tremuloides*	*C. rubescens* *B. repens* *P. myrsinites* *C. geyeri* *A. cordifolia* *O. chilensis* *T. occidentale* *Viola adunca*	Cooper et al. 1987 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981, 1983
Abies lasiocarpa/ Luzula hitchcockii H.T. *L. hitchcockii* (typic) phase *Menziesia ferruginea* phase (MT) *Vaccinium scoparium* phase (ID,MT)	Mountains of Montana west of Continental Divide, Idaho, and western Wyoming (6,000-8,000)	Cool well-drained	*A. lasiocarpa* climax. *P. engelmannii* *Larix lyallii* minor climaxes	*P. engelmannii* *P. contorta* *P. albicaulis* *L. lyallii* (MT)	*L. hitchcockii* *M. ferruginea* *V. scoparium* *A. cordifolia* *A. latifolia* *X. tenax*	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981, 1983
Abies lasiocarpa/ Carex geyeri H.T. *A. lasiocarpa-Picea engelmannii/ C. geyeri* H.T. *C. geyeri* (typic) phase *Pseudotsuga menziesii* phase (ID,MT) *Artemisia tridentata* phase (ID)	Mountains of central Montana, central Idaho, southern Utah (6,500-9,500), Wyoming, and Colorado (8,500-11,000)	Cool dry	*A. lasiocarpa* climax or co-climax with *P. engelmannii*. *P. albicaulis* minor climax	*P. engelmannii* *P. menziesii* (MT,ID) *P. contorta* *P. albicaulis* *P. tremuloides*	*C. geyeri* *A. tridentata* *B. repens* *R. woodsii* *S. oreophilus* *A. cordifolia* *Lathyrus lanszwertii* *L. argenteus* *O. chilensis* *S. stellata*	Alexander et al. 1986 Hess and Alexander 1986 Hess and Wasser 1982 Hoffman 1988 Hoffman and Alexander 1976, 1983 Komarkova et al. 1988 Pfister et al. 1977 Steele et al. 1981, 1983 Youngblood and Mauk 1985

Teble A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successionel status	Tree associetes	Principal undergrowth species	Authority
Abies lasiocarpa/ Carex rossii H.T.	Mountains of southeastern Idaho, northwestern Wyoming (7,500-8,000), and central and southern Utah (8,500-10,500)	Cool dry	*A. lasiocarpa* climax	*P. engelmannii* *P. menziesii* *P. contorta* *P. flexilis* *P. tremuloides*	*C. rossii* *A. patula* *Ribes viscosissimum* *A. cordifolia* *A. engelmannii* *A. misar*	Steele et al. 1983 Youngblood and Mauk 1985
Abies lasiocarpa/ Aconitum columbianum H.T.	Mountains of central and southern Utah (7,400-10,000)	Cool moist	*A. lasiocarpa* climax. *P. engelmannii* minor climax	*P. engelmannii* *P. menziesii* *A. concolor* *P. tremuloides*	*A. columbianum* *R. montigenum* *B. ciliatus* *A. rubra* *A. cordifolia* *G. richardsonii* *O. chilensis*	Youngblood and Mauk 1985
Abies lasiocarpa/ Actaea rubra H.T.	Mountains of central Idaho, northern Utah, and northwestern Wyoming (6,000-8,000)	Warm moist	*A. lasiocarpa* co-climax with *P. engelmannii*	*P. engelmannii* *P. pungens* *P. menziesii* *P. contorta* *A. concolor* *A. grandis* *P. tremuloides*	*A. rubra* *B. repens* *L. utahensis* *R. parviflorus* *V. globulare* *O. chilensis* *T. landlari*	Mauk and Henderson 1984 Steele et al. 1983
Abies lasiocarpa/ Arnica cordifolia H.T. [*A. lasiocarpa-Picea engelmannii/A. cordifolia* H.T.] *A. cordifolia* (typic) phase *P. engelmannii* phase (ID,NW WY) *Shepherdia canadensis* phase (ID,WY) *Astragalus miser* phase (ID, NW WY)	Mountains of Montana east of Continental Divide, central Idaho, northwestern and north-central Wyoming (7,000-9,500), and south-central and western Colorado (9,000-11,000)	Cool dry to well-drained	*A. lasiocarpa* climax or co-climax with *P. engelmannii*	*P. engelmannii* *P. menziesii* *P. contorta* *P. albicaulis* *P. flexilis* *P. tremuloides*	*A. cordifolia* *S. canadensis* *A. misar* *E. angustifolium* *F. ovalis (F. virginiana)* *P. secunda*	Hoffman and Alexander 1976 Komarkova et al. 1988 Pfister et at. 1977 Steele et al. 1981, 1983
Abies lasiocarpa/ Arnica latifolia H.T.	Mountains of southeastern Idaho, northern Utah, and northwestern Wyoming (7,400-9,300)	Cool dry	*A. lasiocarpa* climax	*P. engelmannii* *P. menziesii* *P. contorta* *P. albicaulis* *P. tremuloides*	*A. latifolia* *P. myrsinites* *R. montigenum* *A. engelmannii* *P. racemosa* *P. secunda*	Steele at al. 1983
Abies lasiocarpa/ Caltha biflora H.T.	Mountains of central Idaho (6,200-7,800)	Cool wet	*A. lasiocarpa* climax	*P. engelmannii* *P. contorta*	*C. biflora* *L. involucrata* *Dodecantheon jeffreyi* *Pedicularis bracteosa* *S. triangularis*	Steele et al. 1981
Abies lasiocarpa/ Clintonia uniflora H.T. *C. uniflora* (typic) phase *Menziesia ferruginea* phase *Vaccinium caespitosum* phase (MT) *Aralia nudicaulis* phase (MT) *Xerophyllum tenax* phase	Mountains of northwestern Montana, and northern and central Idaho (3,500-6,000)	Warm moist to well-drained	*A. lasiocarpa* climax. Minor climaxes *A. grandis* *T. martensiana*	*A. grandis* *T. martensiana* *P. engelmannii* *P. menziesii* *P. contorta* *P. monticola* *P. ponderosa* *L. occidentalis*	*C. uniflora* *M. farruginea* *P. myrsinites* *V. caespitosum* *V. globulare* *A. nudicaulis* *C. occidentalis* *X. tenax*	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981
Abies lasiocarpa/ Coptis occidentalis H.T.	Mountains of central Idaho (5,100-6,700)	Warm to well-drained	*A. lasiocarpa* climax	*P. engelmannii* *P. menziesii* *P. contorta* *L. occidentalis*	*C. occidentalis* *M. ferruginea* *V. globulare* *Anemone piperi* *X. tenax*	Steele et al. 1981
Abies lasiocarpa/ Erigaron eximius (E. superbus) H.T.	Mountains of southwestern Colorado, northern and southwestern New Mexico, and eastern Arizona (9,000-11,000)	Cool moist to well-drained	*A. lasiocarpa* co-climax with *P. engelmannii*	*P. engelmannii* *P. menziesii* *A. concolor* *P. pungens* *P. flexilis* *P. strobiformis* *P. tremuloides*	*E. eximius (E. superbus)* *B. repens* *L. involucrata* *A. cordifolia* *G. richardsonii* *L. arizonicus*	Alexander et at. 1987 DeVelice et at. 1986 Fitzhugh et at. 1987 Moir and Ludwig 1979
Abies lasiocarpa/ Gallum triflorum H.T.	Mountains of northern Montana (5,000-7,700)	Werm moist	*A. lasiocarpa* climex	*P. engelmannii* *P. menziesii* *P. contorta* *L. occidentalis*	*G. triflorum* *A. rubra* *S. triangularis* *S. amplexifolius*	Pfister et el. 1977
Abies lasiocarpa/ Lathyrus arizonicus H.T.	Mountains of north-central Arizona and southwestern New Mexico (9,500-10,500)	Cool dry	*A. lasiocarpa* climex or co-climax with *P. engelmannii*	*P. engelmannii* *P. menziesii* *P. strobiformis* *P. tremuloidas*	*L. arizonicus* *A. glabrum* *S. oreophilus* *B. ciliatus* *G. richardsonii* *S. stellata* *V. americana*	Fitzhugh et al. 1987 Moir and Ludwig 1979
Abies lasiocarpa/ Martensia ciliata H.T.	Mountains of northern New Mexico and southern Colorado (9,200-11,200)	Cool moist	*A. lasiocarpa* co-climex with *P. engelmannii*	*P. engelmannii* *P. tremuloides*	*M. ciliata* *Carex bella* *C. leptosapala* *Cardamine cordifolia* *M. pantandra* *O. tandieri*	DeVelice et al. 1986
Abies lasiocarpa/ Osmorhiza chilensis H.T. *O. chilensis* (typic) phase *Pachistima myrsinites* phase (ID)	Mountains of southeastern Idaho and northern Utah (6,500-8,800)	Warm moist to well-drained	*A. lasiocarpa* climax	*P. engelmannii* *P. menziesii* *P. contorta* *P. flexilis* *P. albicaulis* *P. tremuloides*	*O. chilensis* *B. repens* *P. myrsinites* *C. rossii* *O. depauperata* *T. landieri*	Meuk and Henderson 1984 Steele et al. 1983
Abies lasiocarpa/ Pedicularis racemosa H.T. *P. racemosa* (typic) phase *Pseudotsuga menziesii* phase (UT)	Mountains of southeastern Idaho, northwestern Wyoming, and northern Utah (7,000-9,500)	Warm dry to well-drained	*A. lasiocarpa* climax or co-climax with *P. engelmannii* (CO)	*P. engelmannii* *P. menziesii* *P. contorta* *P. flexilis* *P. albicaulis* *P. tremuloides*	*P. racemosa* *P. myrsinites* *S. oreophilus* *A. cordifolia* *A. engelmannii* *L. lanszwertii* *P. secunda*	Mauk and Henderson 1984 Steele et al. 1983
Abies lasiocarpa/ Polemonium pulcherrimum H.T. [*A. lasiocarpa-Picea engelmannii/ P. pulcherrimum* H.T.]	Mountains of south-central Colorado (10,500-11,000)	Cool dry	*A. lasiocarpa* co-climax with *P. engelmannii*	*P. engelmannii*	*P. pulcherrimum (P. delicatum)* *Vaccinium* spp. *C. leptosapala* *Osmorhize obtusa*	Komarkova et al. 1988
Abies lasiocarpa/ Saxifrage bronchialis H.T. (Scree forest)	Mountains of northern New Mexico and southern Colorado (10,000-11,000)	Cool dry	*A. lasiocarpa* climax or co-climax with *P. engelmannii*	*P. engelmannii* *P. menziesii* *P. strobiformis*	*S. bronchialis* *J. communis* *R. montiganum* *K. cristata (K. macrantha)* *C. rossii* *F. ovalis (F. virginiana)*	DeVelice et el. 1986
Abies lasiocarpa/ Senecio sangulsorboides H.T. *S. sangulsorboides* (typic) phase *Psoudotsuga menziesii* phase	Mountains of southern New Mexico (≥10,000)	Cool dry to well-drained	*A. lasiocarpa* co-climax with *P. engelmannii*	*P. engelmannii* *P. menziesii* *P. tremuloides*	*S. sangulsorboides* *R. montigenum* *Ribes wolfii* *E. eximius (E. superbus)*	Alexander at al. 1984a Moir end Ludwig 1979

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
Abies lasiocarpa/ Senecio triangularis H.T. [*A. lasiocarpa-Picea engelmannii/ S. triangularis* H.T.]	Mountains of central and western Colorado (9,500-11,000)	Cool wet stream bottoms	*A. lasiocarpa* co-climax with *P. engelmannii*	*P. engelmannii* *P. contorta*	*S. triangularis* *A. cordifolia* *C. leptosepala* *E. arvense* *M. ciliata* *Streptopus* spp.	Hess and Alexander 1986 Komarkova et al. 1988
Abies lasiocarpa/ Streptopus amplexifolius H.T. *S. amplexifolius* (typic) phase *Menziesia ferruginea* phase (ID) *Ligusticum canbyi* phase (ID)	Mountains of Idaho and northern Utah (3,500-8,000)	Warm moist to wet	*A. lasiocarpa* climax. *P. engelmannii* minor climax	*P. engelmannii* *P. menziesii* *A. grandis* *P. contorta* *P. monticola*	*S. amplexifolius* *M. ferruginea* *Ribes lacustre* *L. canbyi* *S. triangularis*	Cooper et al. 1987 Meuk and Henderson 1984 Steele et al. 1981, 1983
Abies lasiocarpa/ Thalictrum occidentale H.T.	Mountains of southeastern Idaho and northwestern Wyoming (7,600-8,900)	Warm well-drained	*A. lasiocarpa* climax	*P. engelmannii* *P. menziesii* *P. contorta* *P. albicaulis* *P. tremuloides*	*T. occidentale* *A. cordifolia* *G. richardsonii* *O. chilensis* *P. racemosa*	Steele et al. 1983
Abies lasiocarpa/ Xerophyllum tenax H.T. *X. tenax* (typic) phase *Vaccinium globulare* phase (ID,MT) *Vaccinium scoparium* phase (ID,MT) *Luzula hitchcockii* phase (MT) *Coptis occidentalis* phase (ID)	Mountains of eastern Washington, Idaho, Montana, and northwestern Wyoming (5,000-8,500)	Cool dry	*A. lasiocarpa* climax. *A. grandis* minor climax in some phases	*P. engelmannii* *P. menziesii* *P. contorta* *P. monticola* *P. albicaulis* *P. ponderosa* (MT) *A. grandis* *L. occidentalis*	*X. tenax* *V. globulare* *V. membranaceum* *V. scoparium* *L. hitchcockii* *C. geyeri* *C. occidentalis* *T. occidentalis*	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Pfister et al. 1977 Steele et al. 1981, 1983
Abies lasiocarpa/ Moss spp. H.T. [*A. lasiocarpa-Picea engelmannii/* Moss H.T.]	Mountains of southeastern Wyoming, south-central Colorado (8,500-10,500), northern New Mexico, and south-central Arizona (9,500-11,500)	Cool dry to well-drained	*A. lasiocarpa* co-climax with *P. engelmannii*	*P. engelmannii* *P. menziesii* (NM) *P. contorta* (CO) *P. aristata* *P. flexilis* *P. tremuloides*	Moss spp. *A. glabrum* *J. communis* *Rosa* spp. *V. caespitosum* *V. myrtillus*	Alexander et al. 1986 DeVelice et al. 1986 DeVelice and Ludwig 1983 Komarkova et al. 1988
Abies lasiocarpa-Pinus albicaulis H.T.	Mountains of northern Idaho and eastern Washington (≥6,000)	Cool dry	*A. lasiocarpa* co-climax with *P. albicaulis*	*P. albicaulis*	*V. scoparium* *Luzula glabrata* *C. geyeri* *X. tenex*	Daubenmire and Daubenmire 1968
Tsuga mertensiana series						
Tsuga mertensiana/ Menziesia ferruginea H.T. *M. ferruginea* (typic) phase *Luzula hitchcockii* phase (ID) *Xerophyllum tenax* phase (ID)	Mountains of Montana, northern Idaho, and eastern Washington (5,000-6,500)	Cool moist	*T. mertensiana* climax or co-climax with *A. lasiocarpa*	*A. lasiocarpa* *P. engelmannii* *P. menziesii* *P. contorta* *P. monticola* *P. albicaulis* *L. occidentalis*	*M. ferruginea* *R. albiflorum* *V. globulare* *V. scoparium* *L. hitchcockii* *P. secunda* *X. tenex*	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Pfister et al. 1977
Tsuga mertensiana/ Luzula hitchcockii H.T. *L. hitchcockii* (typic) phase *Menziesia ferruginea* phase (MT) *Vaccinium scoparium* phase (MT)	Mountains of Montana west of Continental Divide, and northern Idaho (6,000-6,500)	Cool well-drained	*T. mertensiana* co-climax with *A. lasiocarpa*	*A. lasiocarpa* *P. engelmannii* *P. contorta* *P. albicaulis*	*L. hitchcockii* *M. ferruginea* *V. scoparium* *A. latifolia* *X. tenax*	Cooper et al. 1987 Pfister et al. 1977
Tsuga mertensiana/ Clintonia uniflora H.T. *C. uniflora* (typic) phase *Menziesia ferruginea* phase *Xerophyllum tenax* phase	Mountains of northern Idaho (4,800-5,700)	Warm moist	*T. mertensiana* climax. *A. lasiocarpa* may be minor climax	*A. lasiocarpa* *P. engelmannii* *P. menziesii* *A. grandis* *P. contorta* *P. monticola* *L. occidentalis*	*C. uniflora* *M. ferruginea* *C. occidentalis* *P. secunda* *T. trifoliata* *V. orbiculata* *X. tenax*	Cooper et al. 1987
Tsuga mertensiana/ Streptopus amplexifolius H.T. *S. amplexifolius* (typic) phase *Menziesia ferruginea* phase *Luzula hitchcockii* phase	Mountains of northern Idaho (5,000-6,000)	Warm moist	*T. mertensiana* climax. *A. lasiocarpa* may be minor climax	*A. lasiocarpa* *P. engelmannii* *P. menziesii* *L. occidentalis*	*S. amplexifolius* *M. ferruginea* *L. hitchcockii* *S. triangularis* *T. caroliniensis*	Cooper et al. 1987
Tsuga mertensiana/ Xerophyllum tenax H.T. *X. tenax* phase *Vaccinium scoparium* phase (ID) *Luzula hitchcockii* phase (ID)	Mountains of northern Idaho and northwestern Montana (5,000-6,500)	Cool dry	*T. mertensiana* climax or co-climax with *A. lasiocarpa*	*A. lasiocarpa* *P. engelmannii* *P. menziesii* *P. monticola* *P. contorta* *P. albicaulis* *L. occidentalis*	*X. tenax* *V. globulare* *V. membranaceum* *V. scoparium* *C. rubescens* *L. hitchcockii* *C. geyeri*	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Pfister et al. 1977
Pinus albicaulis series						
Pinus albicaulis/ Juniperus communis H.T. *J. communis* (typic) phase *Shepherdia canadensis* phase	Mountains of southeastern Idaho and northwestern Wyoming (8,000-9,800)	Cool dry	*P. albicaulis* co-climax with *P. contorta*	*P. contorta* *P. flexilis*	*J. communis* *A. uva-ursi* *S. canadensis* *A. cordifolia* *A. miser*	Steele et al. 1983
Pinus albicaulis/ Vaccinium scoparium H.T.	Mountains of Montana and northwestern Wyoming (8,500-10,500)	Cool dry	*P. albicaulis* co-climax with *P. contorta*. *A. lasiocarpa* *P. engelmannii* minor climaxes	*P. contorta* *A. lasiocarpa* *P. engelmannii*	*V. scoparium* *P. nervosa* *C. rossii* *A. cordifolia*	Pfister et al. 1977 Steele et al. 1983
Pinus albicaulis/ Carex geyeri H.T.	Mountains of Montana and northwestern Wyoming (7,500-9,500)	Cool dry	*P. albicaulis* co-climax with *P. contorta*	*P. contorta*	*C. geyeri* *F. idahoensis* *S. occidentalis* *T. spicatum* *A. millefolium* *S. multiradiata*	Pfister et al. 1977 Steele et al. 1983
Pinus albicaulis/ Carex rossii H.T. *C. rossii* (typic) phase *Pinus contorta* phase	Mountains of northwestern Wyoming (6,500-10,500)	Cool dry	*P. albicaulis* climax or co-climax with *P. contorta*. *A. lasiocarpa* *P. engelmannii* minor climaxes	*P. contorta* *A. lasiocarpa* *P. engelmannii* *P. flexilis*	*C. rossii* *P. nervosa* *A. cordifolia* *E. engustifolium* *L. ergenteus*	Steele et al. 1983
Pinus albicaulis/ Festuca idahoensis H.T.	Mountains of Montana, southeastern Idaho, and northwestern Wyoming (9,500-10,000)	Cool dry	*P. albicaulis* climax	Usually pure stands	*F. idahoensis* *O. asperifolia* *A. microphyllia* *A. miser* *L. ergenteus*	Pfister et al. 1977 Steele et al. 1983
Pinus albicaulis-Abies lasiocarpa H.T.	Mountains of Montana and northern Idaho (≥8,000)	Cool dry	*P. albicaulis* co-climax with *A. lasiocarpa* *P. engelmannii*	*A. lasiocarpa* *P. engelmannii*	*V. scoparium* *A. latifolia* *H. grecile* *X. tenex*	Cooper et al. 1987 Pfister et al. 1977
Larix lyallii series						
Larix lyallii-Abies lasiocarpa H.T.	Mountains of Montana west of Continental Divide, and northern Idaho (≥8,500)	Cool dry	*L. lyallii* co-climax with *A. lasiocarpa* *P. albicaulis*	*A. lasiocarpa* *P. engelmannii* *P. albicaulis*	*P. empetriformis* *V. scoparium* *L. hitchcockii* *A. latifolia*	Cooper et al. 1987 Pfister et al. 1977

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Habitat types and community types and their phases for the major forest tree species in the Rocky Mountain and Intermountain regions are tabulated. Included are the name(s), general location, elevation, relative site, successional status, principal tree and undergrowth associates, and the authority.

Keywords: Forest vegetation, classification, habitat type, community type

Rocky Mountains

Southwest

Great Plains

U.S. Department of Agriculture
Forest Service

Rocky Mountain Forest and Range Experiment Station

The Rocky Mountain Station is one of eight regional experiment stations, plus the Forest Products Laboratory and the Washington Office Staff, that make up the Forest Service research organization.

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Research programs at the Rocky Mountain Station are coordinated with area universities and with other institutions. Many studies are conducted on a cooperative basis to accelerate solutions to problems involving range, water, wildlife and fish habitat, human and community development, timber, recreation, protection, and multiresource evaluation.

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